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HEALTH LITERACY AND HEALTH RELATED BEHAVIOUR IN THE HOSPITAL WORKFORCE

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Abstract

Background: According to surveys, health literacy amongst the Austrian population is with more than 50% insufficient scores, problematic. There has to the knowledge of the author of this thesis not been a study measuring the health literacy levels amongst hospital employees (Sattler & Muschnig, 2019). Lifestyle choices have a strong influence on the health of individuals and groups. The connection between health literacy and health related behaviour is not yet fully understood. This study was designed as a joint thesis. The first part to evaluate health literacy levels amongst the hospital workforce, the second to explore health related behaviour in relation to health literacy amongst the hospital workforce. This thesis presents the lifestyle related part of the stud.

Objective: The aim of our study was exploring the relationship between health literacy and lifestyle choices.

Methods: Following an online questionnaire consisting of the European Health Literacy Survey (HLS-EU-Q47) and the Newest Vital Sign (NVS), administered in an Austrian hospital semi-structured interviews were conducted in the same hospital to explore the lifestyle choices associated with health literacy (Satter & Muschnig, 2019).

Results: No direct correlation between health literacy and healthy lifestyle choices could be found. Definition of health literacy varied amongst participants. The awareness of HL was not related to making healthy lifestyle choices. Key moments that functioned as wake-up calls, and general motivation to live healthy were defined as leading factors for lifestyle changes towards healthier behaviours.

Conclusion: Self-perceived health literacy scores amongst hospital employees were higher than amongst the general population, more than one third of hospital employees had problematic HL scores (Sattler & Muschnig, 2019). A direct correlation between healthy lifestyle choices and HL could not be found. Motivation, key defining moments, and social environment could be defined as main factors that influence health related behaviour.

Table of Contents

1.	Theoretical background	1
	Concept development and definition	1
1.2.	Social determinants	2
1.2.1.	Social determinants and their influence on health	2
1.2.2.	Social determinants and literacy	11
1.2.3.	Social determinants and health literacy	12
1.3.	Lifestyle	15
1.3.1.	Definition	15
1.3.2.	Lifestyle and its influence on health	17
1.3.3.	Lifestyle and disease prevention	22
1.3.4.	Lifestyle and health literacy	25
1.4.	Austria	26
1.4.2.	Social determinants in Austria	47
1.5.	Health literacy in the healthcare sector	27
1.5.3.	Lifestyle in the hospital workforce	60
2.	Methodology	30
2.1.	Purpose and significance of this study	30
2.2.	Research questions	32
2.2.1.	Health literacy among hospital employees	32
2.2.2.	Health literacy in different employment categories	32
2.2.3.	Health literacy and health related behavior as part of lifestyle	33
2.2.4.	Further exploratory objectives	34
2.3.	Study design	35
2.3.1.	Subjects and setting	36
2.3.2.	Data collection	36
2.3.4.	Interviews	38
2.4.	Data analysis	40
2.4.1.	Analysis of qualitative results	40
2.5.	Ethical considerations	40
3.	Results	41
3.2.	Qualitative results	41
3.2.1.	Health literacy	41
3.2.2.	Lifestyle	42

3.2.3.	Physical activity	44
3.2.4.	Nutrition	44
3.2.5.	Smoking	46
3.2.6.	Alcohol consumption	46
3.2.7.	Environment	48
3.2.8.	Prevention and vaccination	48
3.2.9.	Media and information	51
3.2.10.	Workplace	52
3.2.11.	Healthcare system and promotion	54
4.	Discussion	55
4.1.	Health literacy and health related behaviour as part of lifestyle	55
4.1.1.	Lifestyle and health literacy	55
4.1.2.	Physical activity	56
4.1.3.	Nutrition	57
4.1.4.	Smoking	59
4.1.5.	Alcohol consumption	60
4.1.6.	Correlation between health literacy and lifestyle choices	61
4.1.7.	Influence of health literacy on lifestyle choices and health	63
5.	Strengths and limitations	64
6.	Conclusion	67
7.	References	69
8.	Annex	86

Table of Figures

Figure 1.1	Health literacy is where skills/abilities meet demands/complexity	2
Figure 1.2	The factors that influence an individual's health and wellbeing	5
Figure 1.3	The poverty/affluence - way of life/lifestyle continuum	13
Figure 1.4	Generic Vienna Model of Health Literacy Defining Principal Determinants & Consequences of HL	15
Figure 1.5	The causal chain - causes of ischaemic heart disease	19
Figure 1.6	Conceptual framework of the social determinants of inequalities in obesity	20
Figure 1.7	Potential gain of life expectancy (2004)	24
Figure 1.8	Total family policy generosity and child poverty in 20 countries (2000)	26
Figure 1.9	Total family policy generosity and infant mortality across 18 countries (2000)	27
Figure 2.1	Sequential explanatory design	35
Figure 3.1	Influence of health literacy	42
Figure 3.2	Qualitative findings: Alcohol consumption in the hospital workforce	47
Figure 3.3	Qualitative findings: Prevention in the hospital workforce	49
Figure 3.4	Qualitative findings: Vaccination patterns	49
Figure 3.5	Qualitative findings: Influenza vaccination	51
Figure 3.6	Health related workplace factors	53

List of Tables

Table 1.1	10 leading risk factor causes of death 2004	23
Table 2.1	Interviewee Characteristics	38
Table 2.2	Interview Topics	39

Table of Abbreviations

ADM	Administrative employees
ALLS	Adult Literacy and Life Skills Survey
AHRQ	Agency for Healthcare Research and Quality
ATHIS	Austrian Health Interview Survey
CDC	Centers for Disease Control and Prevention
CSDH	Commission on Social Determinants of Health
DP	Disease prevention
EU	European Union
HALS	Health Activities Literacy Scale
HC	Health care
HiAP	Health in All Policies
HL	Health literacy
HLS	Health literacy survey
HLS-EU-Q	European health literacy survey questionnaire
HP	Health promotion
ILO	International Labour Organization
ISCO	International Standard Classification of Occupations
max	maximum
MED	medical professionals
min	minimum
NALS	National Adult Literacy Survey
NVS	Newest Vital Sign
OECD	Organisation for Economic Co-operation and Development
ÖPGK	Österreichische Plattform Gesundheitskompetenz
REALM	Rapid Estimate of Adult Literacy in Medicine
SD	Standard deviation
SDH	Social Determinants of Health
SUP	Support staff
TOFHLA	Test of Functional Health Literacy in Adults
WHO	World Health Organization

1. Theoretical background

1.1. Health literacy

1.1.1. Concept development and definition

“The exact definition of health literacy has been addressed from various perspectives. In its publication, the Institute of Medicine used the health literacy definition of the National Library of Medicine (Institute of Medicine (US) Committee on Health Literacy, 2004): “The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan & Parker, 2000). The World Health Organisation (WHO) defined health literacy as “the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health” (Nutbeam, 1998), and the American Medical Association sees health literacy as “the constellation of skills, including the ability to perform basic reading and numeral tasks required to function in the healthcare environment” (Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs & American Medical Association, 1999). While the American Medical Association focuses on an individual's ability to function in the healthcare environment, the Institute of Medicine places weight on health related decisions and the WHO even includes the promotion of good health (Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs & American Medical Association, 1999; Institute of Medicine (US) Committee on Health Literacy, 2004; Nutbeam, 2000). From these definitions, it becomes clear that health literacy entails more than the capacity to read and discuss health information. Most definitions agree with the statement of Parker in 2009: “One must align skills and abilities with the demands and complexity of the system. When that is accomplished, one has health literacy” (Figure 1.1) (Parker, 2009). (...) Differences in the definitions mostly lie in the extent, in which health literacy also relates to health and behavior (Abel & Sommerhalder, 2015). In general, health literacy skills are essential for making decisions regarding an individual's health, for example when it comes to giving consent for participating in a research study or using the right to vote about health issues. The concept also includes the ability to use medical tools and properly dose medication (Institute of Medicine (US) Committee on Health Literacy, 2004). Broader concepts see health literacy as a prerequisite for health related behavior in everyday life, extending also into social behaviors within a family and neighborhood context. Hence, it encompasses an individual's or group's ability to create living conditions that foster health (Abel & Sommerhalder, 2015). Overall, the trend shows an extension of the term “health literacy”. In

this context, “health” does not just refer to disease topics but also includes prevention, promotion and general public health. Similarly, the term “literacy” is expanding to cover access, appraisal, and application of information (Pelikan & Ganahl, 2017). Paashe-Orlow and Wolf (2007) suggest that health literacy is a patient and system phenomenon that has an influence on health outcomes. They theorize, that access to and utilization of healthcare is influenced by navigation skills, self-efficacy, and perceived barriers, while knowledge, beliefs and participation in decision-making influence patient/provider interactions; motivation, problem-solving, self-efficacy, and knowledge and skills influence self-care (Paashe-Orlow & Wolf, 2007). (Muschinig in Sattler & Muschnig, 2019)”

Figure 1.1 Health literacy is where skills/abilities meet demands/complexity



Adapted from Parker, 2009

“The various conceptual models of health literacy have finally been addressed in a systematic review by The European Health Literacy Consortium (HLS-EU) in 2012, which defined comprehensive health literacy as follows (Muschinig in Sattler & Muschnig, 2019)”:

“Health literacy is linked to literacy and entails people’s knowledge, motivation and competences to access, understand, appraise, and apply health information in order to make judgments and take decisions in everyday life concerning healthcare, disease prevention and health promotion to maintain or improve quality of life during the life course.”

(Sørensen et al., 2012)

1.2. Social determinants

1.2.1. Social determinants and their influence on health

Social determinants of health (SDH) are social and economic factors that influence the health status of groups and individuals and have an influence on differences in the health status of individuals within a group (Braveman, 2014). According to the Commission on Social Determinants of Health (2008), SDH is not limited to healthcare and its distribution, but to “the conditions in which people are born, grow, live, work, and age.” The research on social

determinants of health in the past years has increased rapidly. SDH is however not a new topic. The fact that social and economic factors are having an impact on health is long known and was first written about in the 19th century in the framework of the sanitary campaigns in Europe during that time. In the early 19th century Virchow and Engels wrote about structural determinants of health (ARCADE). The attention placed on the importance of research and actions in the field of SDH rose again in the early 21st century. In 2005, the World Health Organization established the Commission on Social Determinants of Health. Social factors may cause lower health and inequity (CSDH, 2008; arcade-project). SDH and health inequality is a complex issue that needs to be addressed by societies and governments alike (CSDH, 2008).

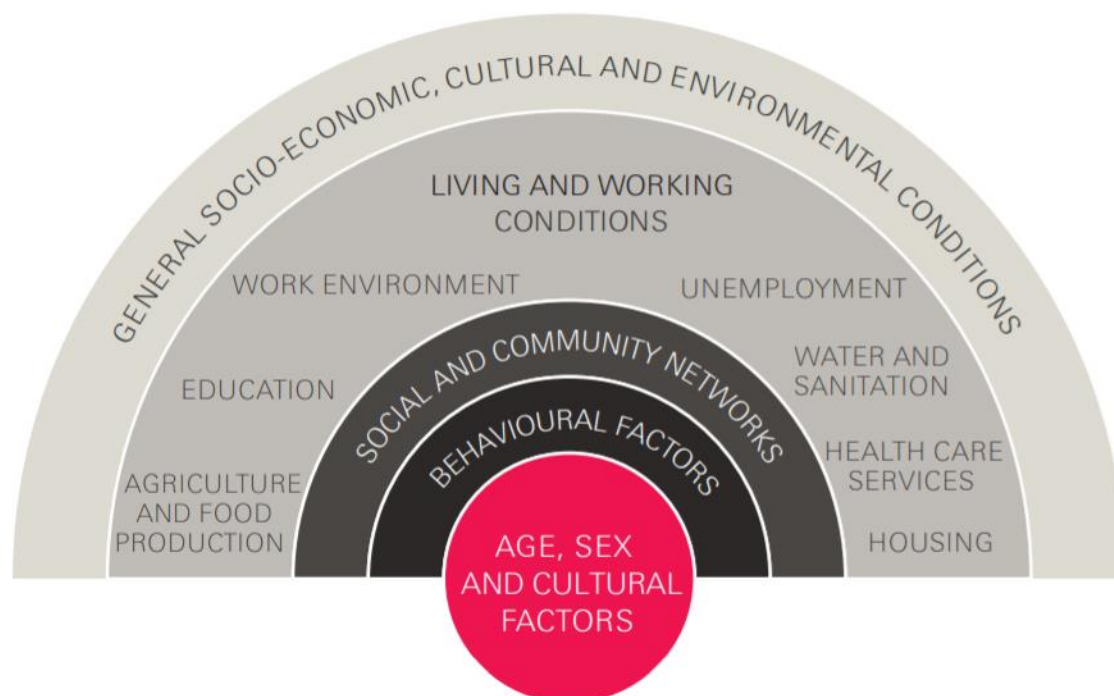
All social determinants of health are interrelated, therefore they have to be perceived both individually, and as a pattern of factors. “It is important to consider relative contribution rather than absolute and to note that determinants do not act alone or in “simple additive fashion,” but rather in concert with one another in complex, interdependent, bidirectional relationships (McGovern, 2014).” The influence of social determinants of health and health literacy has been tried to measure but is difficult to estimate since all determinants are interdependent. The measurement of health literacy fails to take into account the complex and comprehensive relationships of social structures and cultures. Cultural and social influences on knowledge about health, behaviors that are directly, or indirectly related to health, and beliefs are not reflected by the aggregation of health literacy (Guzys et al., 2015). The competence associated with health literacy varies depending on context and culture (Kickbusch et al., 2013). Social determinants are not limited to social factors that can influence health related behaviors such as the availability of social interaction, healthy food, and outdoor activities. Socioeconomic factors such as income and education are a fundamental part of the social determinants of health and have a strong influence on people’s health (Braveman, 2014). These conditions of living and working include a number of different determinants. There is no set definition of which factors are included in the list of SDH. The WHO names the following determinants: social gradient, stress, early life, social exclusion, work, unemployment, social support, addiction, food, transportation (Wilkinson & Marmot, 2003). Over the years different institutions have created lists which include different determinants or categorize determinants differently. The categorization of which aspects of life are defined as social determinants of health and which ones don't differ from source to source and different institutions may group determinants of health together differently. People’s access to health is shaped strongly by factors outside of the healthcare sector. The conditions people are confronted with result in unequal opportunities for people to access health (The Health Foundation, 2018). Yearly, more than 10 million children between the ages of 0 to 5 years die.

45% of these deaths occur in Africa, and 30% in South-East Asia. The main causes of child death in this age group are infections and diarrhea. They are furthermore the leading causes of loss of healthy life years, particularly in developing countries. Underweight and malnutrition, mainly undernutrition and suboptimal breastfeeding, cause 35% of deaths among children, as well as 32% of loss in healthy life years. Insufficient sanitary measures, unsafe water, and smoke from burning solid fuels indoors cause 23% of deaths among children (WHO, 2009). Indoor smoke is a housing issue with a socioeconomic and environmental base. Malnutrition is caused by socioeconomic status, lack of access to healthy foods, as well as literacy, to improve nutrition and many other factors. Social determinants of health are interrelated and play an important role in people's access to health.

Social determinants influence health in many different ways, some of which are difficult to measure. There have been different approaches to analyze and assign a weight to all the different determinants of health and different approaches to categorize them (Kindig, Booske, Remington, 2010) Determinants of health can be roughly categorized into policymaking, social factors, health services, individual behavior, biology and genetics (Office of Disease Prevention and Health Promotion). The National Association of Counties (David, Sternthal, Social, 2010) contributes weight to the general determinants of health as follows: 10% access and quality of healthcare, 10% physical environment, 40% social and economic factors, and 40% health behaviors. Social determinants of health can influence health related behaviors such as nutrition, physical activity, and others. Social structures and economic systems are interdependent and influence the access to health for people within a population, and therefore the population health as such. These factors have an impact on both disease morbidity, and mortality. However, as Song et al. (2011) state, one of the issues is that "inequities in societal resources are not always detectable by traditional methods for measuring disease burden to establish causal links." Health is not exclusively dependant on healthcare, on the contrary, it starts in families, schools, at work and in (RWJF, 2010). Social determinants are intertwined with one another and influence one another. For example, gender may have an influence on job and salary, which therefore influences socioeconomic status. Another example is the availability of education, which determines future job opportunities (The Health Foundation; 2018). Genetics are also relevant for the likelihood of developing certain diseases, although the impact of the place where a person is born, lives and works are even greater (McGovern, 2014). The health impact of obesity is an example that illustrates the complex interrelations of a wide range of determinants. The location of living may not provide the infrastructure to do sports, healthy food may not be available in certain areas, or could be too expensive for members of the neighborhood. Infrastructure to access healthcare

services is not available everywhere. Workplaces that prohibit physical activity, advertisement of unhealthy food and beverages, little education about nutrition, as well as social groups that promote unhealthy eating habits influence obesity and therefore the health issues related to it (The Health Foundation, 2018). Figure 1.3 shows a model of factors that influence health and wellbeing.

Figure 1.2 The factors that influence an individual's health and wellbeing



Source:

Whitehead, 1991

Health related behaviors are one aspect that influences health strongly. The control individuals have over their health related behaviors are however often limited. (The Health Foundation, 2018) Lovell et al. (2018) analyzed eight social determinants further to give a comprehensive picture of their influence on health. These eight determinants are 1. Friends, family and communities, 2. Money and resources, 3. Education and skills, 4. Good work, 5. Our surroundings, 6. The food we eat, 7. Transport, and 8. Housing (The Health Foundation, 2018). This list does not contain all determinants of health, as mentioned before there is no definite list, nor a definite definition of which determinants fall into SDH (Braveman, 2014). Taking a closer look at these eight examples from Lovell et al. gives a comprehensive, albeit not a complete picture of the diverse and complex influence SDH has on the health of individuals and accordingly on population health (The Health Foundation, 2018). The education of all involved stakeholders

involved with SDH is important. This includes education about how to handle food, nutritional education, as well as physical education and general health (WHO, 2014).

1.2.1.1. Social environment

What Lovell et al. (2018) described as “friends, family, and communities”, describes the social environment of an individual. Loneliness and social isolation are an often underestimated factor in individual health (The Health Foundation, 2018). People who experience loneliness have a 30% higher risk of suffering from cardiovascular disease (Valtorta et al., 2016). Being connected with other people, such as family members causes people to live happier and healthier lives. This results in better physical, as well as mental health (The Health Foundation, 2018; Holt-Lunstad, 2010). Experiencing love and learning self-value in early childhood helps to develop social skills and emotional bonds (Allen et al., 2015). This, on the other hand, builds in many aspects a foundation for lifelong healthy habits (Dyson et al., 2009, Bellis et al., 2014). According to Kiecolt-Glaser (2001), relationships with other people in later life, especially with partners, can affect health as well. The likeliness of physical activities is also increased by social contacts, and therefore indirectly influencing health (Hawkley & Cacioppo, 2013, The Health Foundation, 2018). **Learning depends on the work, community, and social situation an individual is born into, grew up in and lives in; thus the development of HL depends on the social environment, an individual lives in** (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017).

1.2.1.2. Economic status

“Poverty damages health and poor health increases the risk of poverty (Benzeval M et al., 2014).” Financial resources have an impact on many aspects of an individual's life. In the UK, 20% of people live in poverty, while 50% of them come from households with employed people (Barnard, Kumar, Wenham, Smith, Drake, Collingwood, Leese, 2017). Stress is increased by poverty and often goes along with the feeling of not being in control. It is furthermore less likely to both begin, and continue healthy behaviors (The Health Foundation, 2018). Full inclusion in a society is often only possible if a sufficient economic status allows people access to services that are needed for a healthy life. Among the 20 to 24-year-olds, 48% live under the minimum wage of the UK (Office for National Statistics, 2017). In working individuals, poverty is often hard to measure as it is determined by individual salary as well as collective household income (WHO, 2010). People with debt are less likely to study. Around 40% of people in such situations would not pursue a university education (Lane, 2016). **This leads to lower education for people living in poverty. Education**

and the opportunities to make healthy lifestyle choices strongly depends on the economic background of individuals and groups (CSDH, 2008).

1.2.1.3. Education

Education is understood as a process, which lasts the entire life. It begins with birth and ends with the moment of death. This applies to both, formal and especially informal education. Especially early education until the end of secondary school is important for a child's development of cognitive and social skills. Education on physical, emotional/social, and cognitive skills should start even before primary school. Educating children on these aspects has proven to improve not only children's attendance at school but also the educational achievements of those children. Children from low-income families and children of parents with low education are more likely to not attend a school or to drop out of school, especially in low-income countries. Initiatives to reduce out-of-pocket payments for those families have proven to increase school attendance and educational attainments of children. In many societies around the world, girls have less access to education than boys. Access to health is therefore also limited by sex (CSDH, 2008). **“Low health literacy skills have not only been found to be related to poor health but have also been shown to have a relationship with the level of education: People with lower education were found to demonstrate lower health literacy skills in comparison with people with higher education (van der Heide, Wang, Droomers, Spreeuwenberg, Rademakers, et. al., 2013)”**.

Higher education helps to develop healthier habits and to live in more secure environments (Egerter, 2011). Among those with the lowest life expectancy, there are three times as many people without proper education, than amongst those members of society with the highest life expectancy (Office for National Statistics, 2017). Education gives access to better jobs and therefore a higher economic status. This work and the continuous learning process creates self-value and independence. Furthermore, the security of keeping a job or finding new jobs increases, which results in lower stress (The Health Foundation, 2018).

1.2.1.4. Employment

Employment, or as indicated by Lovell (2018) “Good Work” is influenced by education and therefore also by socioeconomic status. Young adults that do not work are more than twice as likely to suffer from mental health issues, than young adults who are employed. “Good work” includes good working conditions, job safety, employee safety, and wellbeing measures, as well as adequate income (The Health Foundation, 2018). Self-determination over one's work and

safety are further factors that have a positive impact on health through employment (CSDH, 2008). A good job influences health through two main mechanisms: emotional/mental influence, and physical influence. It provides self-esteem and increases mental wellbeing. At the same time, working in a good job allows people to afford at least basic living standards, access to society, and to afford healthy behaviors as part of one's lifestyle, such as food, physical activity, and social events (The Health Foundation, 2018; Marmot et al.; Stansfeld, 2006; Kim, von dem Knesebeck, 2015). Fair working conditions and safe workplaces are the minima a decent job should provide (CSDH, 2008). **Employment strongly relates to health literacy, amongst other reasons because it correlates with socioeconomic aspects of life. At the same time health literacy impacts work, it enables safe work environments, and healthier employment conditions** (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017).

1.2.1.5. Environment

Environment or surrounding has a strong impact on health. The Commission on Social Determinants of Health (2008) identified two agendas that need to be addressed. The first is health equity and environmental change. The commission stated that environmental changes have a direct influence on population health. Global warming, for instance, influences people's lifestyles around the world and therefore people's health (CSDH, 2008). Climate change has a huge impact on population health and should be a priority when considering measurements on how to assess population health in the future. Determinants such as climate change, agricultural productivity, urbanization, development in rural areas, and the safety of food are all interconnected and inseparable. Local environments also have an impact on health, both directly and indirectly. The availability of parks and green places does not only result in less air pollution, but also increases the likelihood of people being physically active. Environmental influences are diverse. Amongst environmental influences are also factors like the security of a location, access to educational institutions, places to buy healthy food, availability of jobs, and social connections (The Health Foundation, 2018; NHS Health Scotland, 2016; Balfour et al., 2014). They all play an important role not only on population health, but also in health equity. There is however the need for more research how SDH, climate change and other environmental changes impact one another and how they influence health inequality (CSDH, 2008). **Environment influences the access to knowledge through the availability of libraries, internet, educational institutions, and public services. This includes the access to health information and therefore health literacy** (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017).

1.2.1.6. Nutrition

The food we eat plays a major role in our health. Food and nutrition are part of public health. Access to safe, sufficient and nutritious foods is actually one of the main concerns of public health. Not only the nutritional value of food has an impact on health. Food hygiene is of uttermost importance. Insufficient food safety measures may cause foodborne illness through contaminated produce. Hazards can be of either biological, physical, or chemical nature. The second risk related to food is malnutrition. Malnutrition can either mean undernutrition, which describes a lack of consumption of necessary nutrients, or overnutrition which is the overconsumption of foods in amounts that are unhealthy (Coniglio, 2016). In developed countries, heart disease, diabetes (type 2), and some cancers are related to obesity, which is related to overnutrition (Lyn, 2006). In undeveloped countries undernutrition is one of the main causes for morbidity and mortality (WHO, 2016). This trend is however shifting. Countries in transition from developing or poor countries to developed or wealthier countries quickly develop overnutrition. This is due to the availability of cheap food with high amounts of calories but low nutritional value, which causes obesity. The consumption of these junk foods and the associated obesity are nowadays one of the factors that increase poverty (Danton-Hill et al., 2002). The importance of nutrition begins before birth with the mother's nutrition. Breast feeding in early life years and later choice of foods is essential for health (Black et al., 2008; Victora et al., 2008). There is a shift in population health towards obesity. This is related to a transition in nutrition. The consumption of fats, sugars and other sweeteners, food with high energy density and increasingly processed food are a transition in the nutrition of many societies. Furthermore, the physical activity and therefore the amount of burned energy decreases. Together, these two determinants, nutrition and physical activity, contribute to the global epidemic of obesity. Usually the transition starts in urban areas, due to a multitude of reasons, among them the availability and accessibility of food for bulk purchases, junk and convenience foods and in some areas also larger portions (Dixon et al., 2007). Food security is a foundation of access to health, especially in poor urban settings. The issue of insufficient food safety needs to be tackled through the development of policies that ensure safer production, and the accessibility of nutritious food on local markets. These policies should however also aim at securing other determinants such as employment (CSDH, 2008). The access to good nutrition is predetermined by environmental and socioeconomic aspects, as well as the literacy to identify healthy foods and the transportation means to provide access to these foods (CSDH, 2008). Looking at the costs of healthy food shows how entangled determinants of health are. To get the energy a body needs through healthy food costs three times as much as getting them from unhealthy food (Jones et al., 2014). **Making healthy decisions when it comes to buying and preparing food requires knowledge about nutrition and hygiene. This**

knowledge as part of health literacy is an essential foundation for a healthy diet (Nestle, 2007).

1.2.1.7. Transportation

Transportation of people and products as well as other infrastructures are a determinant that has both direct and indirect impact on the accessibility to health. Direct impacts include the infrastructure to reach medical services, or to call an ambulance, while indirect influences entail the possibility to transport supplies such as food safely to the end customer (The Health Foundation, 2018). Pedestrians in the age of five to nine in most disadvantaged areas have nine times as many serious injuries than those in more advantaged areas (Public Health England, 2014). Transport systems influence the environment by creating access to services and connecting communities, but also by having an impact on noise, pollution etc. Healthy means of transportation systems are beneficial for communities. The access to public transport, the ability to use the bike, or to walk without endangering one's health does not only support the health of individuals but has a less negative impact on the environment, which again is beneficial for the public health. These opportunities lead to healthier lifestyles (Rissel et al., 2012). Transportation connects many determinants of health. It creates access to things people need. This includes jobs, groceries and other goods, social networks, spaces of recreation, physical exercise areas, education, healthcare, and a wide range of other aspects of life. Therefore, transportation has a strong but often underestimated impact on health (United Nations Secretary-General's High-Level Advisory Group on Sustainable Transport, 2016; CSDH, 2008). **Health literacy depends on the access to information. Information may be communicated between people directly, or via other channels. Transportation is an important factor to connect people with other members of society, to education, and healthcare services, all of which have an impact on HL.**

1.2.1.8. Housing

Living conditions are essential to live a healthy life (CSDH, 2008). Cold homes double the likeliness of children to get respiratory problems, compared to children who live in warm households (Marmot Review Team, 2011). According to the Audit Commission in the UK (2009) every pound that is invested in housing for poorer parts of the society saves nearly two pounds of costs for the healthcare and social sector. It also results in less crime and improved health. Housing is not just the physical presence of a place to stay but also provides emotional safety. Having a safe place that is affordable, warm and secure reduces stress, enables people to build social relationships and supports access to employment and other services. A home helps

individuals or entire families to have a better quality of life and greater interdependence (The Health Foundation, 2018). **Health literacy has an impact on how people live. It does not only influence habits but also housing circumstances, such as hygiene, access to clean water at home, heating and other factors that relate to a healthy lifestyle.**

1.2.2. Social determinants and literacy

Social determinants impact access to literacy; at the same time literacy influences health related behaviour and social determinants. Literacy is the “knowledge of a particular subject, or a particular type of knowledge” (Cambridge English Dictionary). It requires certain cognitive skills and often a level of education. Many issues in later life have their origin in childhood teachings. Health issues such as obesity, cardiovascular disease, and mental health problems are just a few among many health related issues that are often influenced by childhood experiences. Other issues that are indirectly related to health and have their roots in early life years are criminality, general literacy, numeracy and economic status (CSDH, 2008). “Health literacy is a critical determinant of health, which can empower individuals and lead to engagement in collective health promotion action and is also a crucial component in the self-management of illness” (McKenna, Sixsmith, Barry, 2018). As mentioned before, social determinants of health and other determinants that influence a person’s life are entangled. Socioeconomic status may influence a person’s access to education, and education has a direct influence of literacy and the ability to comprehend information. (The Health Foundation, 2018) Since early years often set the path for an individual’s future opportunities in life, influencing social determinants as early in life as possible is necessary to provide access to literacy (CSDH, 2008). A multitude of models exist on how programs can be implemented to improve development for children. While some programs have a comprehensive approach, many focus on early literacy (CSDH, 2008). Non-profit organizations such as “Reach Out and Read” in the United States of America try to improve early literacy by providing books to children and parents. The encouragement to read to children and for children to read themselves supports the child’s development and prepares it for formal education in schools. During doctor’s appointments parents are encouraged by care providers to read to their children and are provided with advice as well as books suitable for the child’s age. Social determinants play into this not only by the financial means to afford books, but also in education. If parents have issues reading because they lack the literacy to do so, they also have difficulties to support their children’s cognitive development. In the “Reach Out and Read” program parents with such issues are motivated to tell made up stories by the use of picture books and to name objects found on pictures. Volunteer readers in waiting rooms are supposed to create

familiarity and joy for parents and children to look at books together. Results of the program show that participating parents are more likely to read to their children, and that children improve their results in preschool language tests, which makes further educational success more likely (CSDH, 2008; The Health Foundation, 2018). The ability to read, as part of functioning health literacy has an impact on the behavior and choices of individuals (Parikh et al. 1996).

One problem for the improvement of population literacy is the environment, including political, ecological, and social environments in which individuals live. Especially the informal sector is difficult to reach with policies and intervention programs. In less developed countries, many entrepreneurs in the informal sector have low education and low literacy levels. This is limiting their options to adjust themselves or their work according to regulatory requirements. Interventions therefore have to aim at reaching people from an economic and social perspective. Strengthening of the public sector and education are essential to improve literacy in a population (CSDH, 2008). Literacy is interdependent with the social determinants of health, and often is seen as a part of education. Sex can also pose a barrier in people's access to literacy. In many countries, girls and women have less access to education and hence display lower literacy. In the past years, both literacy and education among women has increased (CSDH, 2008). The UNESCO (CSDH, 2008) indicated that existing initiatives to improve literacy are not sufficient, and has started the UNESCO program 'Literacy Initiative for Empowerment' that is implemented in 35 countries, which have literacy levels under 50%, and those countries with overall more than 10 million people with low literacy. For the study of social determinants of health it is integral to bring people to evaluate their own needs and set priorities, since they may differ for different social groups or populations. There are models that are based on literacy analysis to identify poverty. (CSDH, 2008). This shows how strongly intertwined literacy, social determinants, and poverty are.

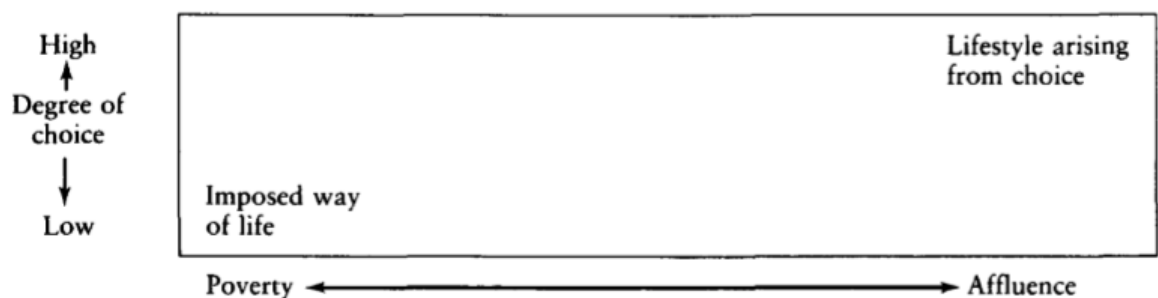
1.2.3. Social determinants and health literacy

Health literacy has an impact on many areas of life and social determinants (CSDH, 2008). It is described as providing the means to understand and evaluate information related to health and allows to communicate this information. Health literacy helps to promote, to maintain, and to improve health. It allows people to understand social determinants, and gives them the opportunity to influence them. At the same time, social determinants influence the access to health literacy, and in some cases health literacy is counted as an SDH itself. The public health sector is interconnected with many other areas that have a direct or indirect influence on health, which is mainly due to social determinants of health. Many health professionals however have insufficient experience with social or environmental areas that influence the health of their

patients. Medical training does not include social work, and many people focus on the treatments and healing possibilities of the healthcare sector only. Evidence shows however that social determinants have a strong influence on health (Braveman, 2014). Furthermore, social determinants including low literacy, language barriers, and cultural diversity all have an impact on health communication (Andrulis and Brach, 2007). It is therefore important to distinguish between population groups of different educational backgrounds and socioeconomic status.

Health literacy has a great impact on human and financial resources in the healthcare system and is important in driving equity (World Health Organization, 2016). The challenges the healthcare sector is facing nowadays force the building of new multidisciplinary teams that are not only technically proficient but also have an understanding of information systems, and organisational skills (European Observatory on Health Systems and Policies 2006). Empowerment strategies in the social sector provide access to awareness of health and understanding of the healthcare system. They further improve health literacy. (CSDH, 2008) Not only do social determinants influence the access to education and health literacy, but health literacy also provides an understanding of SDH, which is important for the population health (Rootman & Gordon-El-Bihbety, 2008). It empowers and gives people more control over their health and allows people to take responsibility over their health and information search (Kickbusch, Wait & Maag, 2006). Even in developed countries health literacy levels are often too low. Furthermore, if seen as a social determinant, health literacy disparities increase health inequity (Kickbusch, Wait & Maag, 2006). Socioeconomic status has a strong influence on health literacy. 20% of people in the UK have issues to understand basic information that could influence their health. Poorer groups in the society have even lower skills to understand this information (Kickbusch, Wait & Maag, 2006).

Figure 1.3 The poverty/affluence - way of life/lifestyle continuum



Source: Veal, 1993

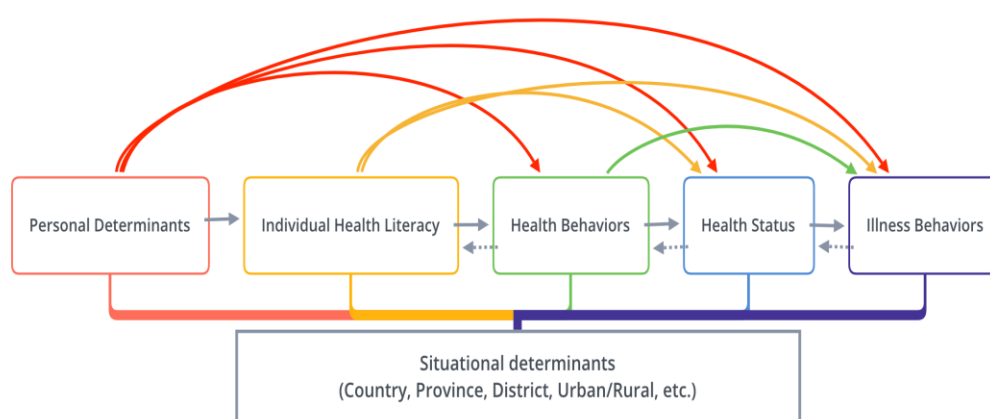
Poverty creates a lack of choice on how to live life. The higher the poverty and therefore the lower the affluence of an individual, the higher the imposed way of life for that person (Figure 1.4). It could however be argued that not only poverty, but power as such has this impact on free choice. The less power, for whatever reason, may it be economic, social, or cultural, the lower the degree of choice (Veal, 2993). Many social determinants influence people's power in positive, as well as in negative ways, the same applies for literacy. The more literate a person is, the higher the power to influence one's own lifestyle. Evidence shows that health literacy has a mediating function on the self-rated health status of individuals. Ethnic and educational disparities are influenced by this effect on self-rated health. Health literacy gives people a better understanding of their own health and provides them with the knowledge on how to live healthier. The evidence on the relationship of different social determinants of health and health literacy is still limited. Assessments to evaluate health literacy and health outcomes vary between studies. Measurement of these complex interrelations are difficult (Mantwill, Monestel-Umaña, & Schulz, 2015). It is however clear that both health literacy and social determinants have an impact on people's lifestyles and their health.

Age, migrational status and socioeconomic factors can influence health literacy. A study that looked specifically at the outcomes of the European Health Literacy Survey in younger (under 25) and older (over 65) German participants showed problematic or insufficient health literacy in 64% of the elderly population and in 70% of the less well-educated young people that had primary education as the highest level of educational achievement. These numbers were even higher when looking specifically at those with migrational background. For comparison, the share of problematic or insufficient health literacy levels was at 46% in the general German population. The authors concluded that not just the education of young respondents with migrational background, but also the socioeconomic status of the respondent's family play a role (Quenzel, 2015). While poor parental health literacy is associated with worse health outcomes in children, it is noted that the influence of familiar upbringing on children's health literacy levels has not been investigated yet (Johnston, Fowler, Wilson, & Kelly, 2015; Lambert & Keogh, 2014a; Nakamura, Ogawa, Nakamura, & Izawa, 2018; Quenzel, Schaeffer, Messer, & Vogt, 2015). Nonetheless, parental involvement and role modelling seem to have the potential to foster healthy lifestyle, such as increased fruit and vegetable intake in children (Godrich, Davies, Darby, & Devine, 2016).

The Generic Vienna Model of Health Literacy highlights the importance of social determinants in relation to health literacy. "Situational determinants" in the model refer to the living or environmental conditions of individuals, which influence personal determinants, individual health

literacy, health behaviours, health status and illness behaviour. Personal determinants further affect individual health literacy, health behaviours, health status and illness behaviour. The direct and indirect influences of all of these factors on each other is depicted in the model (Figure 1.5). The model hypothesizes that there is a directed, reciprocal or cyclical causality. According to the model, health literacy can be understood as a social determinant or mediator/moderator of social determinants on health (Pelikan, 2017).

Figure 1.4 Generic Vienna Model of Health Literacy Defining Principal Determinants & Consequences of HL



Adapted from Pelikan & Ganahl, 2017

1.3. Lifestyle

1.3.1. Definition

“Lifestyle is the distinctive pattern of personal and social behavior characteristic of an individual or a group” (Veal, 1993). There is little consensus on the definition or meaning of the term lifestyle. In literature, thirty or more definitions of the term can be found (Veal, 1991, Veal, 1993). Many definitions agree that lifestyle involves activities. These activities include patterns of consumption, domestic practices, and activities for leisure. Domestic practices are activities such as food preparation, eating, child care, decoration, and furnishing styles, activities connected with personal relationships, home maintenance, and paid occupational activities. Both, work and free time activities influence activity patterns in daily life. Therefore, lifestyle may be described as a combination of day to day activities, ranging from consumption, leisure activities, over domestic activities to work (Veal, 1993). Lifestyle may also be conceptualized as a pattern of values and attitudes. This concept may be used in market research related sources. In this context, it is

sometimes used as a synonym for psychographics, which is done to enable measurability of attitudes and values (Wells, 1974, Veal, 1993). Lifestyle consists of a set of activities and behaviors. In some literature, the term health related behavior is used, in others the term lifestyle. These terms, among others, are often used interchangeably and are often not separable due to the lack of a clear definition. Lifestyles are mainly created by group dynamics. Individuals associate themselves with lifestyles that were developed through processes within social groups. It is however also possible that individuals develop their own lifestyle without a group. It is furthermore not necessary for people with related lifestyles to have contact with one another. Common lifestyles can be developed or adopted without contact between the individuals that follow this lifestyle. Coherence is an important aspect of the analysis of lifestyles that enables one to analyze the patterns of an individual's or a group's lifestyle. Some definitions of the term 'lifestyle' indicate that a lifestyle necessarily includes a set of activities that are compatible or have to make sense together for the person living the lifestyle. As Veal (1993) indicates, however, coherence is not part of all lifestyles and therefore not a part of all aspects and definitions of lifestyles. While it makes sense that a lifestyle consists of activities that match together, it is not a given fact (Veal, 1993).

Lifestyle consists of a set of activities and behaviours. A lifestyle is a pattern of activities, values, or behaviors. While lifestyle describes the entire pattern, the term health related behavior is used in some literature to describe specific factors. In other literature, the term lifestyle choices is used. "Behaviour' includes activities involved in relationships with partners, family, relatives, friends, neighbors and colleagues, consumption behavior, leisure, work (paid or unpaid) and civic and religious activity. Patterns of behavior are linked to values and to socio-demographic characteristics, which may involve varying degrees of social interaction, coherence, and recognizability and are formed through a process of wide or limited choice" (Veal, 1993). The amount of control over one's own lifestyle is however limited. Important decisions that affect the lifestyles of individuals within a society are made by an elite of that society. A multitude of factors impacts the range of control a person has to make lifestyle choices. Such factors may be socioeconomic but may be subtler as well. Consumer behavior is, for instance, one of the aspects of lifestyle that is dependent on the information and access to consumables provided to consumers. Individuals may perceive trivial choices as real, while they might be led by an elite that defined limited options for individuals beforehand and therefore did constrain the freedom of choice. Especially in capitalism, this mechanism can be perceived, but in every society, the range of choice of behavior and lifestyle decisions is limited through outside factors (Veal, 1993). Veal (1993) further states that lifestyle does not have to be recognized as a lifestyle by the public. Few

forms or aspects of lifestyle are recognized by the broad mass of society. An individual's or a group's lifestyle may be a combination, no matter if coherent or not, of different known lifestyles, which makes it difficult to categorize lifestyle (Veal, 1993).

1.3.2. Lifestyle and its influence on health

Lifestyle covers all aspects of life. Many of the behaviors and values that make up a person's lifestyle impact health directly or indirectly. "Nine leading environmental and behavioral risks – high body mass index, low fruit, and vegetable intake, physical inactivity, tobacco use, alcohol use, unsafe sex, urban and indoor air pollution, and unsafe health-care injections – are responsible for 35% of cancer deaths" (WHO, 2009). One specific example of lifestyle-related disease is lung cancer, which has the highest cancer death rate worldwide. Lifestyle-related risk factors are the main causes of lung cancer deaths, of which 71% are due to tobacco smoking. Air pollution in urban areas, smoke from burning solid fuels inside buildings, insufficient consumption of vegetables and fruit, together with tobacco consumption, are responsible for 76% of deaths through lung cancer (WHO, 2009). The practice of unprotected sex is another risk behavior. It contributes to 100% of all deaths related to cervical cancer and unhealthy life years because of cancer. The cancer is caused by the human papillomavirus, which causes infections (WHO, 2009). Vaccinations against human papillomavirus exist and might be a way to reduce the number of infections. Research has shown that socioeconomic status has an impact on people's health and even their life expectancy. This risk factor is often overlooked, although the reduction in life expectancy of low socioeconomic status is 2.1 years. Behavioral factors, which are part of people's lifestyles, can also be health risks and result in a reduced life expectancy. High alcohol intake has a corresponding reduced life expectancy of 0.5 years, obesity 0.7 years, physical inactivity 2.4 years, and current smoking 4.8 years less life expectancy (WHO, 2016). Smoking is a health related behavior that imposes higher risk to health than most other lifestyle factors (WHO, 2015). The WHO's Global Action Plan for the prevention and Control of Non-Communicable Diseases focuses on the following risk factors: high alcohol intake, insufficient physical activity, raised blood pressure, intake of salt, current tobacco use, obesity, and diabetes (WHO, 2016).

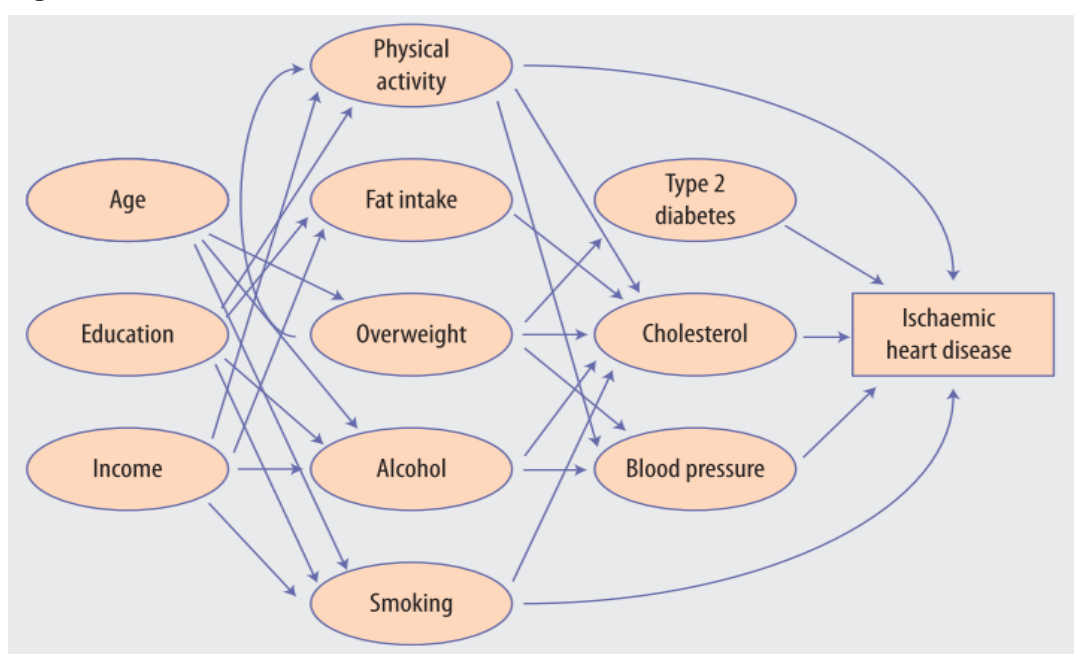
A lifestyle is considered healthy if the activities associated with this lifestyle do not shorten the life expectancy and lower the risk of illness. Further, healthy lifestyles support the family of an individual by providing positive role models for other members of the family, especially for children. A healthy lifestyle also helps individuals to enjoy more aspects of their own lives, including leisure and work (WHO, 2015). Physical activity, next to nutrition, builds one of the most important foundations of a healthy lifestyle. It is an important factor for an individual's wellbeing.

The WHO (2015) recommends everyone should include physical activity into their lifestyle since it is important to keep the body healthy and supports mental wellbeing at the same time. Stamina, strength, and suppleness are three of the most important components of physical fitness. Building up stamina improves the blood circulation, which supplies the heart and lungs and is necessary to gain a slower heartbeat that is more powerful and supports the oxygen supply to the body. Both, extended and heavy exercises are easier to cope with if the body has more stamina. Strengthened muscles are immanent for the ability to perform physical work. Trained muscles support the body posture, which lowers the risk of back, hip and shoulder problems, and helps to reduce strains and risk of injuries. Suppleness prevents pulling muscles and tendons. Mobility of joints, neck, and spine helps to avoid spraining ligaments. Arches and general pains of muscles and joints may be reduced as well if the body obtained more suppleness (WHO, 2015). The design and infrastructure of urban settings influence the level of physical activity of its inhabitants. The density of inhabitants, ability to use public transport, bikes, walk, or the necessity to drive, as well as recreational areas such as parks, and access to public sports facilities impact the behavior of people. Physical inactivity is becoming an increasing issue in middle and high-income countries (Friel, Chopra & Satcher, 2007).

“Moving from ‘health information’ to ‘the way you live your life’ was modulated by some known SDH (work, money and social environment). ‘The way you live your life’ was seen as what determined ‘health and well-being’” (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017). Nutrition is one such SDH and part of a lifestyle that has a strong impact on health. Diet plays an important role in most non-communicable diseases. The consumption of highly refined foods increases globally and more meat and dairy products are consumed. The high quantities of saturated fats and low expenditure of energy in these foods contribute to obesity and related diseases. Overweight increases the risk of many non-communicable diseases (Darnton-hill, 2002; WHO, 1997). The beliefs of what a healthy diet looks like are diverse and many traditions promote unhealthy behavior i.e. the consumption of large amounts of fatty meat on a daily basis. Large amounts of animal fat pose a threat to an individual's health. Meat is only needed in small amounts, if at all, and is not needed daily. Lowering the consumption of animal fat as much as possible is recommended (WHO, 2015). While the WHO (2015) notes that diet choices should also be enjoyed, paying attention to a healthy diet is important to promote and maintain health. The foundation of a healthy diet is built by macronutrients, which can be obtained by following the recommendations of a food pyramid (WHO, 2015). Over-nutrition became an increasing risk factor over the past decades, not only in high-income countries but also in low-income countries. In many countries, over-nutrition and hunger as an epidemic coexist. Obesity and overnutrition related diseases such as diabetes are a global problem (Darnton-Hill, 2002; WHO, 1998). In both

Mexico, and Brazil obesity is no longer associated with high socioeconomic status but instead becomes associated with poverty. This is also the case in many developed countries. Negative changes in diet often come together with changes of behavior by a decrease in physical activities, which increases the negative effect of malnutrition (Darnton-Hill, 2002). Fat and sugar account for over 50% of daily calorie intake for most people in Europe and the United States. A switch from traditional diets to eating habits that include a lot of highly processed foods with low amounts of fiber and high amounts of animal fats, oils and sugars are visible in most developed countries. The consumption of animal products has risen dramatically over the past decades (Darnton-Hill, 2002; Pandya-Lorch & Pinstup-Andersen, 2001). When looking at ischaemic heart disease, for example, it becomes clear how different aspects of lifestyle are connected and influence health together (Figure 1.6). Social determinants of health influence lifestyle choices and health related behavior, which in turn influences health and at the end may cause illness (WHO, 2009).

Figure 1.5 The causal chain - causes of ischaemic heart disease

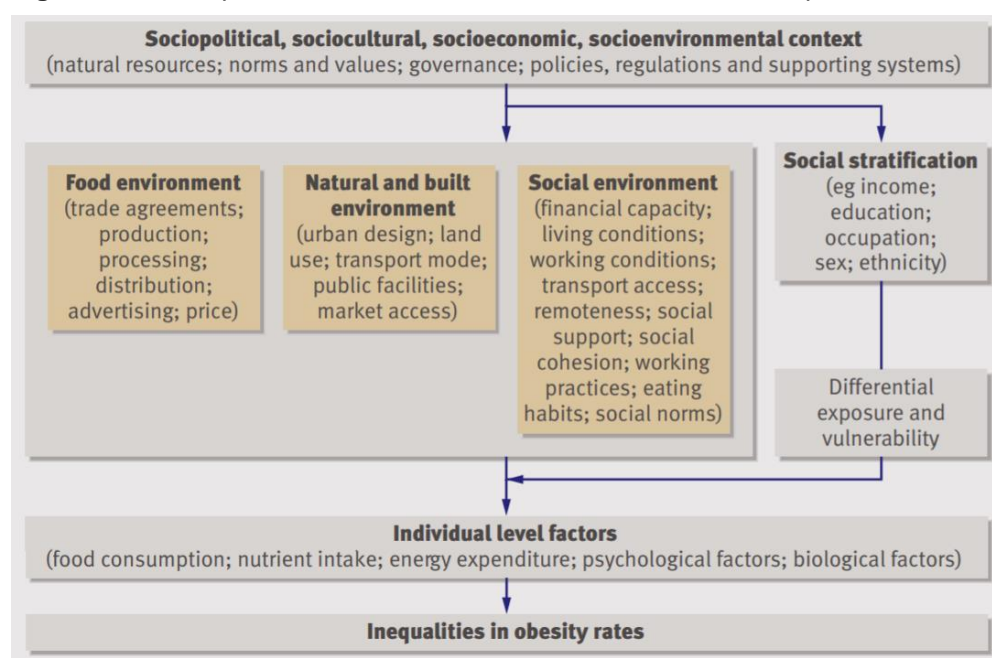


Source: World Health Organization, 2009

Socio-political, sociocultural, socioeconomic, and socio-environmental factors influence health. On the example of obesity these influences become more transparent (Figure 1.6) (Friel, Chopra & Satcher, 2007). This illustrates how lifestyle in all its facets influences health. The environment, both physical and intangible, in which a person is living, together with the person's actions creates a lifestyle, which impacts health, as seen in Figure 1.7 on the example of obesity (Friel, Chopra & Satcher, 2007). "Within the health-promotion paradigm, public health action

requires an approach that acknowledges and addresses social and environmental influences on lifestyle choices“ (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017; Nutbeam, 2000). The marketing of products impacts people’s lifestyle decisions and predetermines the choices individuals have about their own actions, along with changing access to foods. This can be seen in the change of eating culture around the world, where eating habits change towards western style fast foods that replace part of traditional eating habits (Darnton-Hill, 2002; Evans et al., 2001). The food industry spends more money than any other industry on direct advertising (Nestle & Jacobson, 2000). In Mexico, milk consumption went down, while coke consumption raised. Nowadays more coke than milk is consumed in the country (Jacobson, 2000). The environment, through trade agreements, industries, infrastructure, and marketing, influences the availability of unhealthy consumables such as cigarettes, junk food, and alcohol and therefore the lifestyle options for societies (CSDH, 2008). “Brunner and Marmot described how social, economic and environmental structures could impact on health, through lifestyle“ (Rowlands, Shaw, Jaswa, Smith, Harpham, 2017; Brunner and Marmot, 1999).

Figure 1.6 Conceptual framework of the social determinants of inequalities in obesity



Source: Friel, Chopra & Satcher, 2007

“Food is something that everybody understands. It’s difficult to explain to people how they as individuals can do something about climate change, can do something about international conflicts, can do something about corruption in government. But they can do something about the food they eat. And they should“ (Nestle, 2012). The intake of water is important for the body, while larger amounts of alcohol pose a threat to health. The consumption

of small amounts of alcohol as part of social activities is not considered risky behavior. On the contrary, small amounts of alcohol may even be of aid to lower the risk of cardiovascular disease for elderly people, after carefully ruling out any interaction of alcohol with medication (WHO, 2015). Alcohol intake is responsible for close to two million deaths annually (Darnton-Hill, 2002). If the frequency and quantity of alcohol consumption are high, it is considered unhealthy behavior and poses a health risk, according to the World Health Organization (2015). The rates of disability and disease related to alcohol consumption are as high in developed countries in the Americas and Europe, as in developing countries in Africa, and the Americas (Darnton-Hill, 2002). Chronic diseases are a growing burden in both developed and developing countries. Bauer (2014) states that chronic disease burden in the United States is mainly the result of a few risk factors of lifestyle. Around 20% of people around the world smoke cigarettes (Bauer, 2014). Over 1.3 billion people globally use tobacco, circa 1 billion men and 250 million women (Yang et al., 2011). Bauer's list (2014) identifies tobacco use, malnutrition, lack of physical activity, consumption of high quantities of alcohol, uncontrolled high blood pressure, and ignored hyperlipidemia as such risk factors. These risk factors are a burden to individual and population health. In high-income countries, deaths associated with cardiovascular disease occur in older ages than in middle income and low-income countries. By giving higher weight to deaths at a younger age for DALYs, this is usually taken into account by the World Health Organization. Amongst people that are older than thirty, rates for DALYs are the lowest. In European middle-income countries the rate of DALYs through cardiovascular risk factors are already twice as high (WHO, 2009). Incidence rates of chronic conditions are rising, and the demographics of populations are shifting towards older age, and disparities in health are changing factors of the public health (Bauer, 2014). Cerebrovascular disease and cardiovascular disease are two of the leading causes of death. Nearly one-third of deaths worldwide are due to cardiovascular disease, and the WHO (2009) lists eight main risk factors that are associated with 61% of deaths through cardiovascular disease, as well as 61% of loss of healthy life years through cardiovascular disease around the world. Some of these factors are of behavioral nature, such as physical inactivity, nutrition, alcohol consumption, tobacco use, and intake of too low amounts of fruit and vegetable. Other factors are at least influenced by lifestyle choices, such as high blood pressure, high cholesterol, high body mass index, and high blood glucose levels. More than 75% of cases of hypertensive disease, and ischaemic disease are due to the same risk factors (WHO, 2009) High blood pressure is the leading risk factor for death associated with cardiovascular disease. It accounts for 31% of cardiovascular-related deaths in Southeast Asia, and 54% in European countries with middle income (WHO, 2009). Patterns of behavior and consumption change around the world and with it the health related risk factors (WHO, 2009).

1.3.3. Lifestyle and disease prevention

Lifestyle influences health through activities and habits. Amongst those activities are health related behaviors, which cover “any activity undertaken for the purpose of preventing or detecting disease or for improving health and well being” (Conner, 2002). Consequently, lifestyle decisions and behavior have an impact on health and disease prevention. This ranges from physical activity, over-nutrition and housing to social environment. Deficiencies in social connections correlate with the risk of strokes and chronic heart diseases. It is assumed that interventions to reduce loneliness and isolation from social relationships could reduce the risk of some of the leading causes of death in developed countries (Valtorta et al., 2016). A healthy lifestyle reduces the risk of ischaemic heart disease, human immunodeficiency virus/acquired immunodeficiency syndrome, diarrhea, and diabetes. Lifestyle choices that influence these risks are sanitary standards at work and at home, physical activity, nutrition including a healthy diet and the consumption of safe food, practice of safer sex amongst others. The five main risk factors are “alcohol use, tobacco use, high blood pressure, high body mass index, high cholesterol, high blood glucose, low fruit, and vegetable intake, and physical inactivity” and are accountable for circa 61 percent of all deaths related to cardiovascular disease (WHO, 2009). The WHO identified the following 19 risk factors as leading causes DALYs: “childhood underweight, unsafe sex, alcohol use, unsafe water, sanitation, hygiene, high blood pressure, tobacco use, suboptimal breastfeeding, high blood glucose, indoor smoke from solid fuels, overweight and obesity, physical inactivity, high cholesterol, occupational risks, vitamin A deficiency, iron deficiency, low fruit and vegetable intake, zinc deficiency, illicit drugs, unmet contraceptive need.” Many of those risk factors can be influenced by lifestyle choices. The choice of healthy lifestyle options can help to prevent negative impacts on health (WHO, 2009).

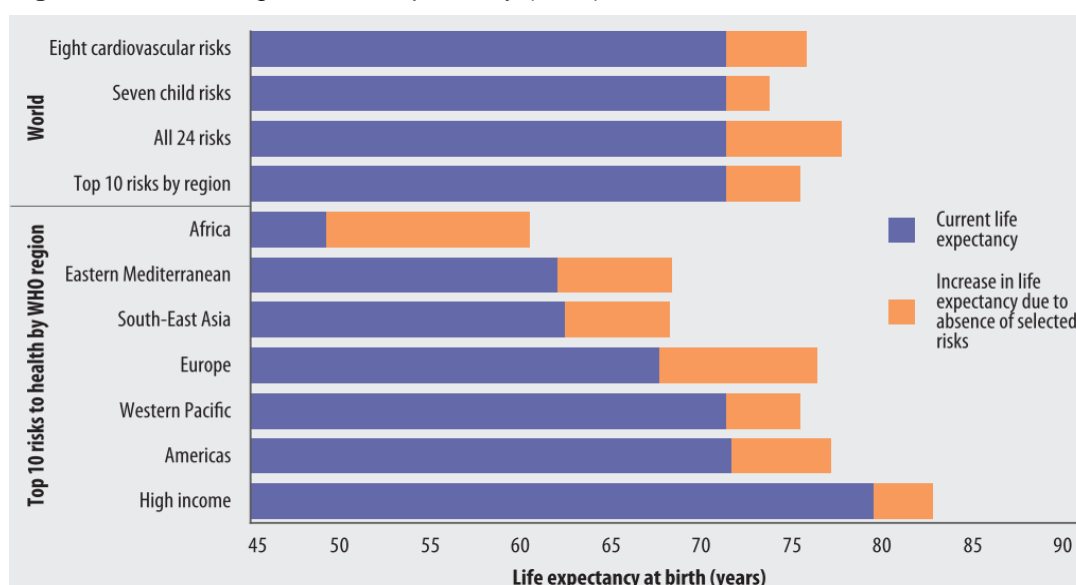
Table 1.1 10 leading risk factor causes of death 2004

Risk Factor	Deaths [millions]	Percentage of total deaths
High blood pressure	7.5	12.8
Tobacco use	5.1	8.7
High blood glucose	3.4	5.8
Physical inactivity	3.2	5.5
Overweight and obesity	2.8	4.8
High cholesterol	2.6	4.5
Unsafe sex	2.4	4.0
Alcohol use	2.3	3.8
Childhood underweight	2.2	3.8
Indoor smoke from solid fuels	2.0	3.3

Source: World Health Organization, 2009

Reduction of these risk factors in people's lifestyle could result in a reduction of disease burden by 75%. 33% of global deaths were associated with the joint effects of the ten most relevant risk factors alone (Table 1.1). Preventive measures that target such risk factors, and changes of lifestyle by individuals or policy makers could reduce the disease burden gravely, and would increase life expectancy by up to 10 years (Figure 1.8). Preventive measures may come in changes of policies, education, infrastructure improvements, or medical checkups. It is imperative that incentives for preventive measures are implemented into the lifestyle of individuals to be effective by influencing risk factors (WHO, 2009).

Figure 1.7 Potential gain of life expectancy (2004)



Source: World Health Organization, 2009

The joint effects of lifestyle activities that are identified as risk factors or health related behavior, sometimes have a greater influence on health than the sum of influences of these factors separately. Eating habits and physical activity are two factors that have a strong impact on health separately but increase their impact when combined. Both factors influence mental as well as physical health. While obesity is influenced by both factors jointly, there are other health risks that are influenced separately, such as vitamin deficiency or back pain (WHO, 2004). Many medical conditions are impacted by more than one health related behavior. The risk of these medical conditions, therefore, can be prevented, by influencing individual factors (WHO, 2009). The most important determinants of health are the same in all countries for which data is available. Especially the consumption of unhealthy foods, physical inactivity, and smoking are lifestyle choices with the most impact. Evidence shows that behaviors that promote health extend life expectancy and reduce DALYs. Preventive actions on an individual level and public health incentives have a beneficial influence on the reduction of risk factors. The WHO recommends that preventive strategies should target sustainable benefits that are not only aimed at individuals at high risk but to the population as such (WHO, 2004). “(...) Physical activity reduces blood pressure, improves the level of high-density lipoprotein cholesterol, improves control of blood glucose in overweight people, even without significant weight loss, and reduces the risk for colon cancer and breast cancer among women”. Adequate levels of physical activity in daily life and as sportive activities are recommended to prevent disease. Different types of physical activities and different quantities of those activities have diverse effects in terms of prevention (WHO, 2004). “Lifestyle plays an important role in staying healthy. Overall health is what we have placed in our

body, we come strictly and consistently to maintain our physical fitness“ (Kumar, 2018). Prevention does not only consist of medical services, but a healthy lifestyle also plays an integral part in the prevention of disease and the promotion of wellbeing.

1.3.4. Lifestyle and health literacy

Health literacy is dependant on general literacy; lifestyle choices and lifestyle circumstances that are forced on people impact literacy. At the same time literacy influences lifestyle choices. Health literacy is no exception to this phenomenon. There have been studies about the correlation between health literacy (HL) and the behavior of individuals, which is part of education as a social determinant of health. As Rudd (2010) states, health literacy encompasses “the skills and abilities needed to gain access to, understand, and use health related information” and can directly impact the behavior of people (Berkman 2004). Health literacy-related researches are mainly focussed on patients and receivers of healthcare, but new findings show that providers’ understanding of the topic is important as well, especially for the communication with patients (Rudd 2010). Health literacy is dependant on the general literacy skills of individuals and levels of a subpopulation (Rudd 2007). The ability to read, as a part of functioning health literacy, has an impact on the behavior and choices of individuals (Parikh et al., 1996; Schwartz et al., 1997; Apter et al., 2008). Self-care behavior and effects on health, and demographic discrepancies in those areas can be explained by health literacy. Health literacy is linked to health outcomes, largely through its influence on behavior. There is “an indirect pathway from health literacy to health status via widely recognized determinants of self-care (knowledge and self-efficacy) and actual self-care behavior (physical activity)” (Osborn et al., 2011). Understanding health information sufficiently to know how to act decreases the probability of physical inactivity, unhealthy diet, underweight, and obesity. The capability to engage with doctors and other healthcare providers actively lowers the risks of physical inactivity, an unhealthy diet, and daily tobacco consumption. These aspects of health literacy are connected to health behaviors and overall health outcomes. Health literacy is an important determinant of health and disease prevention (Aby et al., 2017). Evidence shows that a locus of control has a positive impact on a healthy diet, level of physical activity, reduction of smoking tobacco, and lower alcohol consumption“ (Cobb-Clark et al., 2013). Health literacy takes a mediating role when it comes to self-rated health status and is connected to education, ethnic heritage, and understanding of medical and medication information. HL reduces disparities in this field. Health outcomes are associated with health literacy levels, the complex pathways of this relationship are however not fully understood yet (Mantwill, Monestel-Umaña, and Schulz, 2015). Nutrition is influenced by health literacy, malnutrition is the main risk factor of poor health. Information on nutrition has

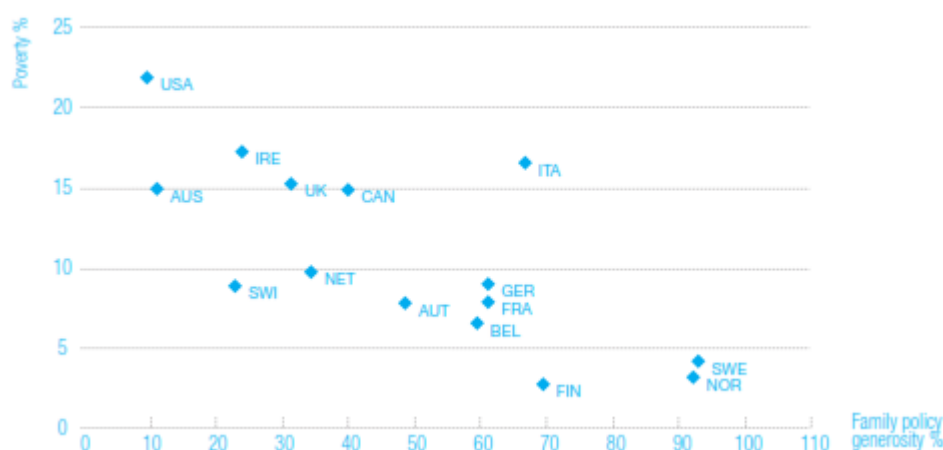
advanced over the past years, finding and using relevant information reduces the risk of unhealthy diets (Mozaffarian, 2016). “The tremendous advances in knowledge that have occurred in the past 25 years leave little room for doubt that social factors are powerful determinants of health” (Braveman, 2014). The resulting literacy influences individuals through their own lifestyle, as well as populations through policies and social determinants.

1.4. Austria

1.4.1. Social determinants in Austria

Living standards are a strong determinant of health. Through the entire life span, the standard of living has an immense impact on people’s health. Social security and an established welfare system reduce poverty. Population health is supported by and dependent on universal social protection systems. Only one out of five people worldwide have basic social security coverage (ILO, 2003). Figure 1.9 shows data from 20 countries around the year 2000. With a family policy generosity around 48%, Austria has a rather low level of poverty of around 6%. This shows that Austria has relatively few people that fall under the poverty line (CSDH, 2008).

Figure 1.8 Total family policy generosity and child poverty in 20 countries (2000)



AUS: Australia; AUT: Austria; BEL: Belgium; CAN: Canada; FIN: Finland; FRAU: France; GER: Germany; IRE: Ireland; ITA: Italy; NET: the Netherlands; NOR: Norway; SWE: Sweden; SWI: Switzerland; UK: United Kingdom; USA: the United States of America
Source: CSDH, 2008

Developed countries such as Austria, with a more generous social protection system have better population health. Results of such systems are lower child mortality and lower mortality levels of disadvantaged groups (CSDH, 2008). Austria has an infant mortality between 0.5 and 0.55% and is therefore in the middle field of the developed countries that Lundberg et al. investigated (Figure 1.10) (2007).

Figure 1.9 Total family policy generosity and infant mortality across 18 countries (2000)



AUS: Australia; AUT: Austria; BEL: Belgium; CAN: Canada; FIN: Finland; FRAU: France; GER: Germany; IRE: Ireland; ITA: Italy; NET: the Netherlands; NOR: Norway; SWE: Sweden; SWI: Switzerland; UK: United Kingdom; USA: the United States of America
Source: CSDH, 2008

Austria is successful in ensuring access to healthcare, within the EU the country has the best results of meeting the needs of healthcare. Non-contracted care is responsible for a large part of out-of-pocket payments in Austria. Although out-of-pocket payments are relatively high in Austria compared to other EU countries, it is compensated for by financial protection for disadvantaged groups in the country (OECD/European Observatory on Health Systems and Policies, 2017). A survey that was conducted in rural Austrian areas showed that overweight can be limited by promoting health awareness. Health awareness functions as a mediator which results in a healthier lifestyle. This function was realized by providing more realistic information about the risks of obesity, which motivated to lose weight (Schoberberger, Dörner, & Rieder, 2013). Another Austrian study associated health knowledge with a change from underestimated health risks to a perspective with less misconceptions (Dörner et al., 2013).

1.5. Health literacy in the healthcare sector

1.5.1. Lifestyle in the hospital workforce

Work environment is a big part of people's life and creates part of people's lifestyle. Different work environments have different impacts on lifestyle. The correlation of lifestyle and work environment is not yet fully understood. To understand the context and influence

of health literacy on workers in the healthcare sector qualitative approaches can be used (Creswell 2014). Workers are often little involved in the creation of occupational programs related to health promotion (Roter, et al. 2006). Workers' perspective on the relation of health literacy to behavioral and lifestyle decisions is essential to understand the impact of health literacy. Differences in the level of health literacy and its perceived connection to behavior is not yet understood entirely (Rudd 2010). Hence, exploring health literacy levels corresponding to their lifestyle choices and the perceived influence of their health literacy level on these is important to understand the correlation between health literacy and lifestyle amongst workers in the healthcare system. "Health behaviours may be influenced by numerous biological, psychological, and social factors (Sutton, 2008)." The work environment is one of these factors and subsequently influences health related behaviours. "Health professionals may be assumed to make healthier lifestyle choices and have better health outcomes than others due to greater health literacy, education, and experience with patients "(Dayoub & Jena, 2015). However, little is known about the actual health outcomes of professionals in the healthcare sector in relation to the rest of the population. According to Dayoub and Jena (2015) obesity is less common amongst health professionals, than the population average. The increase of percentage of diabetes amongst health professionals is lower than in the general population in the United States, the increase of percentage amongst this group is however similar to the increase the population indicates. Generally, health professionals have a slightly healthier lifestyle, especially in terms of smoking habits, and physical activity levels. Alcohol consumption is however similar to the rest of the population. "Moderate-to-heavy alcohol consumption was more common among health professionals in recent years and increased from 19.5% in 2005 to 23.2% in 2013, with a similar increase observed in other occupations (17.9% to 20.1%) "(Dayoub and Jena, 2015). Heavy alcohol consumption amongst health professionals is however lower (1%) than amongst the general population (4%). There are no significant gender differences concerning health related behaviours amongst health professionals, with the exception of diabetes and heavy alcohol consumption. Diabetes declined amongst male healthcare professionals but increased amongst female healthcare professionals and the general population. Heavy alcohol consumption did not increase amongst male health professionals over the past years, but did however increase amongst female workers in all occupational fields and amongst men in non health related occupations (Dayoub and Jena, 2015). Health literacy levels are strongly linked to health related behaviour and health outcomes such as obesity. This applies to health professionals as much as other individuals. Health professionals are however assumed to have higher health literacy than the general population (Shih et al., 2016; Dayoub and Jena, 2015). "Health professionals have lower rates of smoking, sedentary activity, obesity, diabetes, hypertension and coronary artery disease compared to other occupations, but

higher rates of moderate-to-heavy alcohol use“(Dayoub and Jena, 2015). Generally, health literacy levels amongst the general population seem to increase, and the changes of health related behaviours amongst health professionals are similar to those amongst other occupations. This indicates that changes in society impact workers in the healthcare sector the same way as workers in other occupations (Dayoub and Jena, 2015).

2. Methodology

2.1. Purpose and significance of this study

As defined by Sattler and Muschnig (2019):

“This study aims to fill several research gaps considering the health literacy levels and lifestyle of hospital workers of different employment categories in Austria.

Health literacy has been a field of growing importance in the past years (Pelikan & Ganahl, 2017). Governments worldwide are now aware of the grave impact that health literacy has on their healthcare systems (Trezona et al., 2018). Low health literacy is connected to worse health outcomes, inefficient use of health services, poor self-management, and can deepen social disparities (Berkman et al., 2004; Kickbusch et al., 2013; Sørensen, 2016). In the face of currently ageing populations and a growing prevalence of non-communicable diseases, health literacy can contribute essentially to better use of the limited resources in healthcare (OECD/European Observatory on Health Systems and Policies, 2017). Still, health literacy levels among the population are low. The European Health literacy survey has shown that more than half of the Austrian population (56.4%) have either insufficient or problematic health literacy levels (Sørensen et al., 2015). Survey results worldwide have led to an implementation of health literacy into governmental policies (Australian Commission on Safety and Quality in Health Care, 2014; Ministry of Health, 2015; Pleasant, 2012; Sørensen, 2016; U.S. Department of Health and Human Services, 2010). In Austria, the existing disparity between healthcare spending and clinical outcomes might be reduced by improving health literacy in the population (London School of Economics and Political Science (LSE Health), 2017). Health literacy is now one of ten health targets for the country (Bundesministerium für Gesundheit und Frauen, 2017b). Furthermore, the Vienna concept of health literate organisations has been developed. Health literate hospitals and healthcare organisations should act as role models and improve health literacy in the community. Improving the health literacy of hospital staff is therefore essential (Pelikan & Dietscher, 2015a). An underestimation of health literacy needs in the population and a low implementation rate of tools that have been encouraged by health literacy experts represent barriers to an effective patient-doctor communication (Bass et al., 2002; Kelly & Haidet, 2007; Rogers et al., 2006; Schwartzberg et al., 2007). Several studies have investigated hospital worker’s perspective on health literacy and found low awareness of the term, varying definitions of the concept and gaps in the knowledge about health literacy (Jukkala et al., 2009; Lambert et al., 2014; Macabasco-O’Connell & Fry-Bowers, 2011; Mackert et al., 2011). However, investigations into the health literacy levels of hospital workers have been focussing only on specific sub-topics or employment

categories so far (Chen et al., 2000; Joyce et al., 2011; Kahouei et al., 2015; Pathak et al., 2016; Wright et al., 2019). There is no data available about the comprehensive health literacy levels of the Austrian hospital workforce. Our study therefore aims to explore the knowledge, awareness and perception of health literacy in Austrian hospital workers.

Since health literacy is influenced by a wide range of socioeconomic factors, this study aims to compare health literacy levels among different employment categories. Especially income and education as socioeconomic factors are an integral part of people's access to health (Braveman, 2014). Educational levels have a direct influence on health literacy (The Health Foundation, 2018). While medical staff members in hospitals all have some kind of health related education, this is not necessarily the case for administrative workers and support staff in hospitals (ISCO). While health professionals are assumed to have higher health literacy (Dayoub and Jena, 2015), there is little known of the health literacy levels amongst other members of the hospital workforce. Findings about the differences of health literacy levels between different employment groups in hospitals could indicate whether or not the work environment influences health literacy (Sattler & Muschnig, 2019)".

2.2. Research question:

As defined by Sattler (Sattler & Muschnig 2019):

“In order to fill the above mentioned research gaps, the objective of this project is to investigate health literacy levels among hospital workers in Austria. The study aims to get a better understanding of the influence of socioeconomic factors by comparing health literacy levels among different employee subgroups and find correlations between health literacy levels and health related behaviour. In order to achieve this, three main research questions and some additional exploratory objectives have been formulated (Sattler & Muschnig, 2019)”:

2.2.1. Health literacy among hospital employees

“Research question: What is the degree of health literacy among hospital employees?”

The first aim of this study is to analyse the health literacy levels of hospital employees. This question is addressed using a questionnaire which evaluates health literacy levels among study participants. The questionnaire has previously been applied in the Austrian population and can therefore provide an insight how the results relate to the general population in Austria. We established the following hypothesis:

Hypothesis: *Health literacy levels among hospital employees are higher than health literacy levels among the general population (Sattler & Muschnig, 2019)”.*

2.2.2. Health literacy in different employment categories

“Research question: How do health literacy levels among different categories of hospital workers differ?”

This part of the research aims to analyze if there is a gradient in the level of health literacy within the healthcare workforce, according to the professional level of healthcare education, and employment status. In order to be able to obtain a more comprehensive picture of the health literacy levels within the healthcare workforce, we decided to categorize the participants into three groups, derived of health workers as defined according to the International Standard Classification of Occupations of the health sector (ISCO). While the first group as used by Mohr (2006) is used unchanged and includes all ISCO groups of health service providers, we decided to partition the

second group of health management and support workers into two separate groups to differentiate further between health management and support workers (Mohr, 2006). Participants are divided into three categories:

- Healthcare professionals such as doctors, nurses, hospice workers, emergency medical technicians, and other trained caregivers
- Administrative employees including management, office staff, human resources, finance, and ward clerks, and other back office clerks
- Support staff members, including patient services assistants, cleaning staff, porters and related professions

Health literacy levels were investigated for each group separately. Secondary analysis focused on the comparison between the three different employment categories and the general population. This led to the following hypotheses:

Hypothesis: *Health literacy levels among medical professionals are higher than among administrative employees or support staff.*

Hypothesis: *Health literacy levels among medical professionals are higher than health literacy levels among the general population*

Hypothesis: *Health literacy levels among administrative employees are higher than health literacy levels among the general population.*

Hypothesis: *Health literacy levels among support staff are higher than health literacy levels among the general population (Sattler & Muschnig, 2019)".*

2.2.3. Health literacy and health related behavior as part of lifestyle

“Research question: How does health literacy relate to lifestyle decisions of hospital workers?”

One goal of this research is to find possible correlations between health literacy levels and lifestyle choices. Questionnaire data will investigate a correlation between health literacy levels and health related lifestyle decisions (e.g. nutrition, exercise, alcohol consumption, smoking behaviour). To get a comprehensive picture of the context and influence of health literacy on workers in the healthcare sector a qualitative approach is used (Creswell 2014). The exploratory research approach aims to get a broad picture of health related lifestyle choices. Interview analysis aims to explore whether participants perceive an influence of health literacy on their lifestyle choices. Workers’ perspective on the relationship between health literacy and lifestyle decisions can give

a first insight into the impact that health literacy has on the lifestyle of the hospital workforce. Additionally, the qualitative approach aims to identify reasons for health related behavioural change .Albeit this method cannot provide causational evidence, a first insight into links and connections can be provided.

Hypothesis: *Workers with high health literacy levels have a healthier lifestyle than those with low health literacy.*

Further objectives:

- *To get a better understanding of the possible correlation between health literacy and lifestyle choices.*
- *To determine interviewees' perspective about the influence of health literacy on lifestyle choices and health.*
- *To identify reasons for health related behavioural changes in people's lifestyles (Sattler & Muschnig, 2019)".*

2.2.4. Further exploratory objectives

"In addition to the three main research objectives of this paper, this research aims to gain a deeper understanding of hospital worker's perspective on health literacy. This includes the following research areas:

- hospital workers' definition of health literacy
- hospital workers' experience with health literacy in the clinical setting
- hospital workers' awareness of health literacy and promotion efforts
- hospital workers' reasoning for perceived questionnaire task difficulty (with a special focus on media literacy, vaccine literacy and preventive measures) (Sattler & Muschnig, 2019)".

2.3. Study design

The research approach consisted of a quantitative and a qualitative part. In order to answer the above mentioned three main research questions, data collection was based on a sequential mixed methods approach (Clark & Ivankova, 2016), which was composed of a quantitative and a qualitative part. This approach allowed to follow the quantitative part of the study up with qualitative research methods that elaborate on the findings of the quantitative part of the research (Clark & Ivankova, 2016). Quantitative data collection was conducted using the HLS-EU-Q86 questionnaire (Sørensen et al., 2015), while the qualitative data collection consisted of semi-structured interviews (Flick, 2015).

While the quantitative part gathered initial data, the qualitative part focused on a deeper exploration of connections. The first part of the study explored health literacy scores. Quantitative methods allow a statistical evaluation of results but provide little insight into the lifestyles of participants. The qualitative part as an explanatory sequential step in the study design allows an exploration of relevant findings from the quantitative questionnaire results. This focus on significant topics allows a more comprehensive exploration of aspects of health literacy (Creswell, 2014). “Mixed methods research is based on the premise that combining qualitative and quantitative methods will produce a deeper understanding than either method could when used alone” (Williams, Kohler, Baskin, Harrington, Ivankova, et. al., 2014). The study design hence enabled an evaluation of health literacy levels as well as an exploration of subjective perspectives on the topic, and allowed a more comprehensive insight into the topic. Through qualitative research, relevant aspects of health literacy and lifestyle choices were analyzed after the questionnaire. Furthermore, different behaviors relevant to health and lifestyle choices were analyzed.

Figure 2.1 Sequential explanatory design



Source: Creswell, 2014

The questions of the qualitative segment of the study were based on the results of the quantitative part, and therefore followed a sequential design (Figure 2.1). The sequential explanatory design of category A after Creswell (2014) was chosen for the mixed methods design of this study. The data collection is however independent of the qualitative part (Creswell, 2014). Thus, the results

of the quantitative part were not trackable to participants of the qualitative part. The quantitative and qualitative part of the study were given the same priority, and roughly the same time was invested in both parts. The findings of the questionnaires were analyzed independently of the findings of interviews. An integration approach was used for the mixed method of quantitative and qualitative findings, only after both methods were analyzed. The results of both parts were discussed together when they related to the same topic (Andrew and Halcomb, 2006; Online, Halcomb, Hickman, 2015). The segregated approach was chosen in order to enable a comparison of quantitative data with population data, as investigated by Sørensen et al. (2015), as well as an analysis of lifestyle patterns through qualitative research. Only in the discussion were these two parts brought together to discuss the relationship of the results (Halcomb and Andrew, 2009).

2.3.1. Subjects and setting

The research was conducted at a public hospital in Austria. 216 hospitals in Austria have been contacted and asked to participate. 98 hospitals were contacted via phone call, and 118 via email. All contacted hospitals received a written request to participate in the study if they did not deny participation on the phone prior to the email exchange. One hospital was able to confirm the participation in time to conduct the research.

Requirements for participating hospitals were the following: 1) Participating hospitals had to agree to let their employees participate in both steps of the data collection (quantitative and qualitative). Hospitals were given the choice to conduct questionnaires on paper, or via mci-students.limequery.com, and to conduct the interviews either in person at their property or via Skype. Hospitals could choose to provide the means to conduct the interviews, including space for the questionnaires/interviews, or a computer with input- and output devices, as well as a stable internet connection for the interview. 2) Participating employees had to be given the time to complete both steps of data collection. 3) Both the hospital management and participating employees were asked to fill out an agreement for the confidential use of anonymized data for the use of this research. The survey data was collected anonymously and interview data was anonymized.

2.3.2. Data collection

The quantitative research in the participating hospital was performed using an online questionnaire, while quantitative interviews were conducted in person.

The questionnaire was sent to hospital employees by the hospital management via email. The distribution was coordinated by the hospital director, who instructed the heads of different employment groups to send the questionnaire to willing participants. Since the response rate amongst support staff was however lower than the other two categories, the questionnaire was sent to this particular group a second time. Only employees with sufficient German language skills were selected for participation. This was done by the hospital management. The questionnaire was done anonymously, no questionnaire date could be associated with individual participants. The questionnaire was open from the 23rd of April until the 9th of June 2019, and accessible via a link to the LimeSurvey questionnaire portal.

The data collection of the qualitative part of the study took place after the analysis of questionnaires in the first phase of the study. Interview topics derived from significant answers in the questionnaires, and by focusing on lifestyle topics related to the initial research questions. Participants for the interviews were selected by a random sampling approach executed by the hospital management. Of every employment category as defined by the researchers, three employees were contacted and asked to participate. The contact was initiated via email. In one case a phone call was chosen, because the employee did not have a work email at this moment. One potential participant of the medical staff chose not to participate, and another random sampling was executed to select a replacement. Of the administrative employees, four potential participants were contacted, due to the assumed absence of one staff member. A total of 10 employees participated in semi-structured interviews (3 medical staff, 3 support staff, 4 administrative employees; Table 2.1) and one unstructured interview with the safety manager of the hospital were conducted. The unstructured interview was not part of the data collection for the qualitative analysis. Instead, it was conducted to receive additional information for suggestions of policies and initiatives. In agreement with the hospital management, participants were invited to face to face interviews at the facility of the hospital but also were given the option to participate in the interviews via Skype. Interviews took place from the 28th of May to the 29th of May 2019 at a conference room in the hospital. All participants chose a face to face interview. Interviewees were assigned codes to keep the interviews anonymous (Table 2.1). To avoid the possibility of backtracking identities, no demographic data was collected. Codes with an S indicate support staff, A indicated administrative employees, and M medical professionals.

Table 2.1 Interviewee Characteristics

Working Title of Interviewee	Gender	Occupation	Medical Training	Code
Support Staff 1	Female	Service	No	S1
Support Staff 2	Female	Assistant	No	S2
Support Staff 3	Male	Assistant	Yes	S3
Administrative employee 1	Male	Admin	No	A1
Administrative employee 2	Male	Accounting	No	A2
Administrative employee 3	Female	Admin	Yes	A3
Administrative employee 4	Male	Accounting	No	A4
Medical Professional 1	Female	Nursing	Yes	M1
Medical Professional 2	Male	Physician	Yes	M2
Medical Professional 3	Male	Physician	Yes	M3

Abbreviations: M = Medical professional, A = Administrative employee, S = Support staff

For the semi-structured interviews guiding questions were developed for every one of the 11 topics. These questions were designed to guide the interview and sustain the conversation while giving participants as much freedom to answer the questions freely and describing own experiences and opinions. To ensure that topics were answered in depth, additional questions were asked by the interviewers (Flick, 2015). All interviews were conducted jointly by both interviewers (one male, one female) to avoid that interviewees might feel uncomfortable to talk about gender-specific health, or lifestyle topics (Grandgirard, Poinot, Krespi, et al., 2002). The content of the interviews was approved by the hospital director prior to the interviews. All interviews were audio-recorded on two devices. At the beginning of each interview, interviewees were asked to sign a data privacy statement that allowed the recording and further use, and storage of the interview data for this study.

2.3.3. Interviews

The qualitative part of the research was the second part of the sequential explanatory design of the research methodology. “Qualitative research methods (...) are often employed to answer the whys and hows of human behavior, opinion, and experience - information that is difficult to obtain through more quantitatively-oriented methods of data collection (Guest, Namey, Mitchell, 2013).” Semi-structured interviews were conducted to obtain a comprehensive picture of the topics identified during the analysis of the quantitative research part of the sequential explanatory research approach. Semi-structured interviews follow only a rough structure of the process of the

interview and give interviewees the opportunity to talk freely. A rough structure helps to keep the conversation in the field of interest (Flick, 2015). The semi-structured interview method was used to explore the experienced impact of health literacy on people's lives. Eleven topics were derived from the answers given in the quantitative questionnaire (Table 2.4). For each topic, guiding questions were prepared to lead the direction of the interviews (Annex, A2).

Interview topics were chosen based on the previously defined research questions and findings in the questionnaire. The "Health literacy" topic was designed to get a better feeling for participant's perception of the administered questionnaire and the term "health literacy". "Physical activity", "Nutrition", "Smoking" and "Alcohol consumption" were chosen to investigate a closer relationship between health literacy and lifestyle decisions. A category called "Lifestyle, Actions, and Health" focused on a deeper exploration of participant's motivation to change health related behaviour. A connection between living conditions and health related behaviour was investigated in the "Environment" category. Previous research has shown that health literacy is connected to the use of preventive services (Berkman 2014), and our findings showed that nearly 20% of the survey participants renounced individual vaccinations. "Prevention and Vaccination" was therefore included as an interview topic. Questionnaire results also showed a difficulty to judge information on the media and low health promotion literacy among hospital employees. The categories "Media and Information sources", "Workplace", and "Healthcare System and Promotion" were hence added.

Table 2.2 Interview Topics

Topics of semi-structured interview
Health Literacy
Lifestyle, Actions, and Health
Physical Activity
Nutrition
Smoking
Alcohol Consumption
Environment
Prevention and Vaccination
Media and Information Sources
Workplace
Healthcare System & Promotion

Topics to guide semi-structured interviews as part of qualitative methodology

2.4. Data analysis

2.4.1. Analysis of qualitative results

The interviews were transcribed by both researchers. Transcribing rules according to Desing and Phel (2018) were used. Simple transcripts were chosen since non-verbal communication was not analyzed in this study. Most interviews were held in dialect and were translated into high German during the process of transcription. Incomprehensible parts of the interviews were marked with “unv”, “unverst”, or “???”. Filler words and verbal errors were not transcribed. Incomplete sentences or breaks were indicated through (...) (Desing and Phel, 2018). Identifying content at the beginning of the interviews was not transcribed to keep the anonymity of the interviewee. Interviewers were indicated either by the first name or A, interviewees were marked as B, or ‘interviewee’.

Qualitative content analysis (Mayring, 2000) was used to analyze the transcribed interviews. For coding and deductive application of categories the qualitative analysis software, MaxQDA 2018 version 10.2.0 was used. Code categories were created by following the topics of the interview questions. A code system was created within the software to group codes and create new code categories (Mayring, 2000). The functionality of the code system and its rules were checked after coding of the first four interviews. Categorization and pooling of codes was done in multiple steps to get a comprehensive picture of the data (Desing & Phel, 2018). The categories were assigned to the 11 topics and used to analyze relations within and between topics.

2.5. Ethical considerations

“This study has been approved by the Ethics Committee of the Management Center Innsbruck (Annex, A3). All survey participants explicitly confirmed their voluntary participation and approved the use of their data for this study before completing the survey (Informed consent – Survey, Annex A3.1.1). Subjects who participated in the interviews additionally agreed to audio recording of their interview and signed another informed consent sheet (Informed consent – Interview, Annex A3.1.2) (Sattler & Muschnig, 2019)”.

3. Results

3.1. Qualitative results

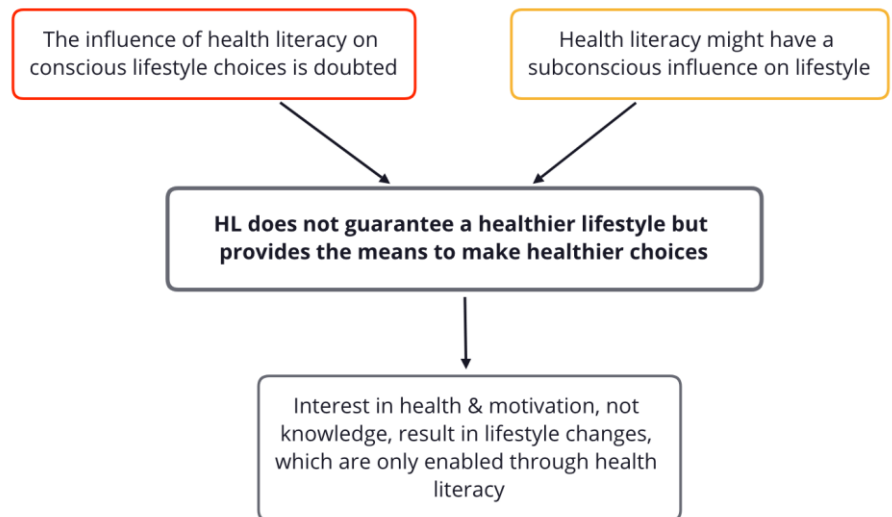
The interview findings were analyzed and are presented in eleven topics. These topics were guideline topics for the semi-structured interviews and were derived from the research questions and themes of the quantitative phase of this study. Especially topics that showed correlations, or scored relevant results were used to identify the interview topics. The findings of the qualitative research part (phase two of the mixed methods approach) are summarized by categories as defined above.

3.1.1. Health literacy

Working in a hospital was believed to have a positive impact on the health literacy of employees. The work environment and tasks of hospital employees were believed to improve the workforce's health literacy (S1, p.260, p.270, p.274; S2, p.28, p.122, p.12; S3, p.66-70, p.78, p.86; A3, p.199-201; A4, p.14: 614; M1, p.42-43, p.88). Health literacy of the Austrian Population was perceived as low (A1, p.92, p.252-254; S2, p.8; S1, p.13-14, p.80; A4, p.4:26-380; M2, p.13) (Figure 3.8). Health literacy education and the provision of health information did not reach everybody equally (M3, p.60; A4, p.13:3-116, p.13:388-863, p.8:1025-1507). The questionnaire was perceived differently by different employment groups A4, p.1:308-421; M3, p.2; M2, p.3; A3, p.5; S1, p.1-2; A1, p.1, p.5-9, p.21). It is, however, important to mention that interviewees of the support staff category did not fill out the questionnaire before the interviews, but after (see limitations). Working in a hospital was believed to have a positive impact on the health literacy of employees (S1, p.260, p.270, p.274; S2, p.28, p.122, p.12; S3, p.66-70, p.78, p.86; A3, p.199-201; A4, p.14: 614; M1, p.42-43, p.88). The main barrier for health literacy to improve lifestyle by initiating change towards healthier behavior was believed to be an inner motivation that overcomes the weaker self (A3, p.73, p.133, p.137; M2, p.21; M3, p.58, p.76-78; S1, p.18; A2, p.22). Main reasons for people to have higher lifestyle was a general interest in health and healthy lifestyle (A4, p.1:772-865, p.4:26-380, p.17:406-584; M2, p.5; M1, p.42; A2, p.36, p.107; M3, p.58; A3, p.137). Other factors supporting better health literacy that were mentioned were a social environment that allowed the sharing of culture and values, as well as knowledge (A4, p.4:562-759, p.4:845-1175, p.3:242-374) and education (M3, p.10; A4, p.12:1156-1554; M1, p.32). Reasons people found for lower HL were: Education (A3, p.21, p.153; A1, p.92-94; M1, p.44; A2, p.180), social aspects including parenting (M1, p.6; S3, p.88; S1, p.16; A3, p.137, p.147; A4, p.16:19655-7:292), and marketing that advertised messages, which were opposing HL (A3, p.205-208). Definitions for HL were diverse. Many had never heard the topic before and still could

formulate an accurate definition, others did not know how to define the term at all (A1, p.74-76, p.250-256; S1, p.6-7; S2, p.1-4; S3, p.4. A3, p.82, M1, p.2-4; M2: p.39; M3, p.6, A4, p.1:575-771).

Figure 3.1 Influence of health literacy



Source: Author's own illustration

3.1.2. Lifestyle

Lifestyle is a pattern of values and actions (Veal, 1003). A healthy lifestyle is a way of living that promotes health. The definition of what health is, did, however, vary greatly from person to person. We can, therefore, conclude that the perception of a healthy lifestyle varies according to individuals' perception of health (M2, p.39; M1, p.10; S1, p.26; S2, p.42; S3, p.1, p.54, p.86; A1, p.99; A2, p.83).

"What is healthy for me? I can not answer that ad hoc, because, well, what is healthy? In this point, opinions differ. What is really healthy now, that's a loose, relative concept. For my part, I say, yes, I live healthy in the sense, that I do not eat processed products and fast food. I take care to get at least some physical activity, that I am not simply driving from the front door into the garage by car, but walk instead. But otherwise, what is healthy? Healthy is walking, healthier might be jogging. I do not know, maybe jogging is also unhealthier for the joints and walking better. So what is healthy? I can not answer the question clearly. For my part, I live the way I like it and how I believe it is good for me (A2, p.83; author's own translation)"

“Being healthy means that you can be active, that you can work, it's just worth living. Because you only see once you've been sick, what you really have. What you can and can not do. And being active, just going out and so on (S1, p.26; author's own translation)”.

“I need time to recover, to relax. And just doing things that I enjoy. The case is, and I am convinced it's true, that I have a good social environment, and that makes me healthier than if I would be alone, I'd say. So that's a blessing and I also appreciate that extremely. Therefore, I think that my personal happiness has an impact on my health as well. But health is also a matter of luck (M1, p.10; author's own translation)”.

Three main reasons for unhealthy behavior have been identified. Health literacy depends on what you do with it. It is a skill one can decide to use. Lack of motivation is a barrier to initiating positive change (A2, p.26-30; A3, p.167; M1, p.101). Socioeconomic status might become a barrier, when lifestyle changes are not affordable (M3, p.48, p.70; A4, p.8:1025-1503, p.16:3-374), or further factors prevent change (M3, p.46; M2, p.59; A3, p.210). Stress is caused by the overload of information, and pressure (M1, p.4, p.82; A2, p.85-87, p.149-153, p.172; A1, p.90; S3, p.52-56, p.42, p.48; S1, p.142). Knowledge alone is not enough for lifestyle changes, motivation is needed (A3, p.73, p.133, p.137; M2, p.21; M3, p.58, p.76-78; S1, p.18; A2, p.22). Routine was experienced to be an important aspect for a healthy lifestyle (M1, p.14; A3, p.123; A2, p.28; S2, p.28-30, p.194, p.200). Some lifestyle changes happen subconsciously, but participants reported situations in life when they actively initiated a change towards a healthier lifestyle (A1, p.180; S1, p.54; S2, p.162; S3, p.11, p.17-19, p.52). Situations that caused the initiation of change were overweight problems (A1, p.180-186), social influence, such as a family deciding to get fitter together (S1, p.30, p.37-43, p.54-58), and work-related experiences (S1, p.32, p.49, p.260). Lifestyle is not only about actions, but also about the actions people avoid, i.e. not eating certain foods (M1, p.30; A3, p.208, p.212, p.101). Opinions about the influence of health literacy on participants' own lifestyles were heterogeneous. Many were of the opinion that health literacy impacts their lifestyle (S1, p.7-10; S2, p.5-6; A1, p.250; A4, p.3:787-1221; M1, p.101; M3, p.10, p.50, p.56, p.86), while some opposed this notion and thought that influence has little to no impact on their own lifestyle (S3, p.6-7; A3, p.199, p.205-208; M2, p.11, p.29). Two participants were of the opinion that the influence of health literacy depended on the specific lifestyle situation (A1, p.88; A2, p.24).

3.1.3. Physical activity

Physical activity was known to be an important determinant of health amongst hospital employees; the spectrum of sports activities reached however from very active to no sportive activity at all. Throughout all employee groups, it was known that sports has an important impact on health (S1, p.51; S2, p.108; A1, p.119; A3, p.59; M1, p.16; M3, p.14). The amount of physical activity amongst hospital employees varied strongly across employment categories. The hospital promoted sports and physical activities through sports programs within the organization (A4, p.3: 1693, p.14: 1602; M3, p.18). The spectrum of physical activity amongst hospital employees ranged from very low (S2, p.105; S3, p.58, A1, p.117) with higher sportive activity rates in the past, to frequently practiced sportive activities (A3, p.48-51, M3, p.14). The implementation of physical activity into daily life, and building habits was seen as important (M1, p.14; A3, p.53; M2, p.25; A4, p.8: 397). Reasons for not being physically active ranged from medical reasons (A1, p.117 & p.119), over a lack of motivation (A2, p.30 & p.34; S2, p.110) to a lack of time for sportive activities (A1, p.109-110; S2, p.68). Most hospital employees implemented at least some physical activities in their lives. Main reasons to become more physically active were physical fitness of the body for both health (M3, p.14; M1, p.16; A1, p.119 & p.99; S2, 108; S1, p.51; S3, p.58), and aesthetic reasons (M3, p.16; S2, p.108; S3, p.58). Another reason for doing sports was stress reduction (A3, p.59; M1, p.16; S3, p.58). Of those that practiced sports on a regular basis, most had fun doing so and stated that it felt good (M1, p.16; M3, p.14 & p.16; A1, p.119; A2, p.34; A3, p.55 & p.59). Physical activity in the social environment of participants was perceived as an important motivational factor for being physically active (M1, p.14; A1, p.117, p.121, p.140, p.68; S1, p.164-168, p.170-171). There was no visible connection between the amount of physical activity and the knowledge about its importance for health.

3.1.4. Nutrition

Nutrition was the topic in which participants participated most. Diet types differed greatly amongst participants (A1, p.30, p.180, p.32, p.64-66; A3, p.23, p.40; S2, p.78, p.162, p.46-48, p.70; S1, p.63, p.67, p.63; S3, p.21; A2, p.58). Nutrition and the evaluation of the healthiness of food were perceived as difficult (S1, p.78-80; A3, p.36; A1, p.38; M3, p.48, p.54). Especially nutritional trends and superfoods caused uncertainty (A3, p.101, p.27, p.21; M3, p.48; M1, p.72; A1, p.140-142; A2, p.21, p.50).

“Yes, when you see all the dietary books out there, I do not want to say they are bad, but I think diet is just different for each person and you do not know what’s right for you. I’m

not saying that it's bad to try it. There is certainly a lot of mischiefs that you do not know about at the time in which you want to try it.” (A1: 142 - 142; author's own translation)

“I do think anyways that every few years the trends change. When I recall (the trends a few years ago), oh my god cholesterol, for God's sake, cholesterol.” (A2: 50 - 50; author's own translation)

“Extra sugar is something I do not need, so I cut it out of my diet, bit by bit. During our studies, we got everything we need to eat a healthy diet. The problem is that you can not look inside the food. We do not have food technology. Sugar substitutes are often converted in the body into other products that are not healthy. No matter, if light foods or low sugar foods. For example, fructose is more commonly converted into fat, than glucose, so fructose-based beverages, for example, are generally less healthy than drinks with glucose. I'm not sure that's all right now, but that's the way I remember it from studying. If you follow this closely, then you actually get all the basics you need to implement a healthy diet. But you can not analyze every food and do not always know what's inside.” (M3, p.54; author's own translation)

Allergies were not understood well, the allergy information on products was however perceived as mostly sufficient (S2, p.68; A1, p.60-62; S1, p.101-107). Mensa food was perceived as having a negative to neutral impact on nutrition (S2, p.56-58; S1, p.84-90; S3, p.25-27; A4, p.12:1-256; A1, p.54-56, A2, p.56; M1, p.26). (Detailed description of mensa related findings in the ‘workplace’ section). Snacking, or having pleasure foods once in a while was the most common unhealthy food habit (A3, p.27, p.40, p.45; M1, p.24; M2, p.51; A4, p.11:1547-1665), followed by overnutrition (A2, p.64; A3, p.21, p.97; M1, p.22). The understanding of overnutrition is however subjective (A3, p.97):

“So is it only conscious when I think, "Come on"? Whatever it is, it could also happen that I eat three oranges on an evening, somehow, while reading or whatever I am doing alongside. It does not make sense, right? It always gets worse, that's clear.” (A3, p.97; author's own translation)

Most dominant healthy eating habits were preparing meals instead of eating processed food (A2, p.56, p.79; A3, p.36, p.27, p.97; M1, p.26), and the moderation of consuming different types of

food (i.e. meat), among participants with medical background (M1, p.24, p.30, p.72; M2, p.95, p.41; M3, p.54; A3, p.195).

3.1.5. Smoking

Tobacco consumption was perceived as unhealthy, but the social influence encouraged smoking. The use of tobacco was known to be unhealthy, which was one of the main reasons not to smoke amongst hospital employees (S3, p.11, p.15-17; S2, p.90-94; A1, p.162; S1, p.139; A3, p.187; A4, p.7: 493-697). Smoking habits were influenced by the social environment. Reportedly, the acceptance of smoking in society had decreased over the past decades. The other way around, an awareness of the impact of smoking on the social environment could also be a motivation for being a better example for one's family (A1, p.158; S1, p.162; S2, p.84; M1, p.56-60; A3, p.179). Peer pressure was perceived as the main reason to start smoking (S3, p.13; S3, p.86; A1, p.158-160; S1, p.152; M1, p.56; A2, p.149; A4; M3, p.44). Another social factor that encouraged smoking was the perceived coolness of smoking in the society, which was promoted through media (A2, p.141-143; M1, p.31, p.56; M3, p.42). Health consequences of smoking were known, but this knowledge did not prevent smoking (S3, p.7; S2, p.6, p.32; S1, p.154; A2, p.22, p.50; A3, p.69). Practicing sports was a reason not to smoke (S1, p.162; A3, p.193). The quantity of smoked cigarettes increased when a smoker experienced stress (S1, p.139; S2, p.86; S3, p.11; A2, p.151).

All of the interviewed support staff employees were smokers or had been active smokers in the past. (S1, p.132-135; S2, p.6, p.81-82; S3, p.8-9). None of the medical employees were smokers, one of them had been a smoker in the past (M1, p.53-54). Amongst the administrative employees was one smoker (A2, p.139). The main issue of smoking besides the social acceptance of tobacco consumption was the habit or addiction that made it difficult to stop (M1, p.53-54, p.4, p.60; M2, p.25; M3, p.44; A2, p.139, p.147; A3, p.187; S1, p.137; S2, p.82, p.88, p.152; S3, p.9) Main reason for smoking seemed to be social pressure, the main reason to stop on the other hand were health concerns.

3.1.6. Alcohol consumption

Most hospital workers consumed very little alcohol; if they were drinking it was on social events. The levels of alcohol consumption in the hospital workforce were very low. Participants stated that they drank either very little amounts of alcohol, or at least in moderation, which included a drink once in a while (S1, p.191, p.199; S2, p.89; S3, p.44; A1, p.169; A3, p.195; M1, p.68; A4, p.7: 940; M2, p.35; M3, p.36). Two main reasons for low alcohol consumption were found. Reduced consumption of alcohol due to health concerns was the main reason to moderate

one's alcohol intake (S3, p.44; 171, p.175; A3, p. 193; M1, p.70; M3, p.38, p.42). Another reason for low alcohol intake was the impact other lifestyle factors had on alcohol consumption. Especially physical exercise and car driving were lifestyle factors that had an impact (A3, p.193; A4, p.7: 1128; M3, p.36; Figure 3.9). Some participants stated that they saw no reason for drinking alcohol (S1, p.193, p.195; S2, p.102) and others that they disliked the taste (S3, p.44; M2, p.35). Most participants did, however, consume alcohol once in a while. The main reason to consume alcohol was a social occasion. Alcohol was perceived as being widely accepted in the society and was part of many social gatherings. The wide acceptance of alcohol and the resulting social pressure were the main reasons for consumption (A1, p.171, p.173; A2, p.149; A3, p.191; A4; p.7: 1379; S1, p.201; S2, p.100; S3, p.44; M1, p.66; M2, p.35; M3, p.38, p.42).

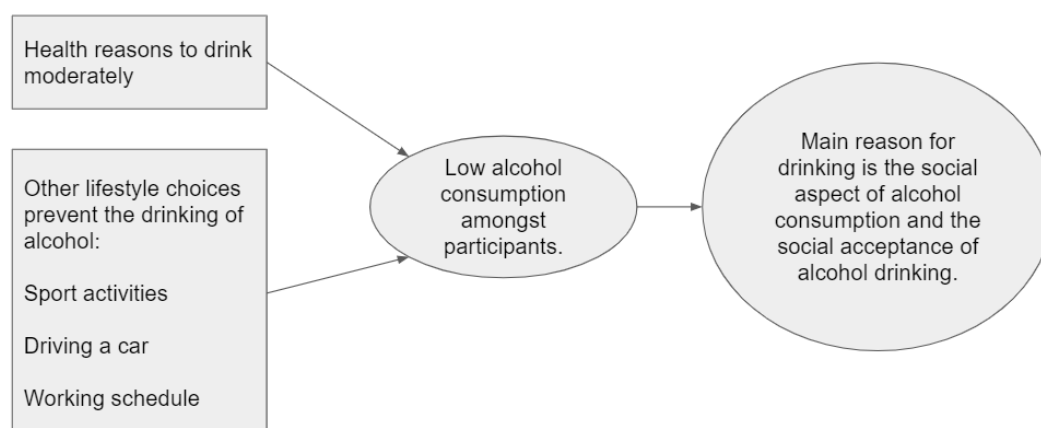
“Wine and beer already have cult status or cultural status (M3, p.42; author's own translation).”

“Because I do not like it (alcohol). So I drink every now and then, when someone invites me, or it is a social thing. Then I also think, I should drink something now, but then I think I would rather have had an apple juice with soda (M2, p.35; author's own translation).”

“I drink alcohol with my partner, otherwise I do not drink alcohol (A4; p.7: 1379; author's own translation).”

“(Alcohol consumption is) mostly a story-related story. If you're at a party somewhere or something (A3, p.191; author's own translation).”

Figure 3.2 Qualitative findings: Alcohol consumption in the hospital workforce



Source: Author's own illustration

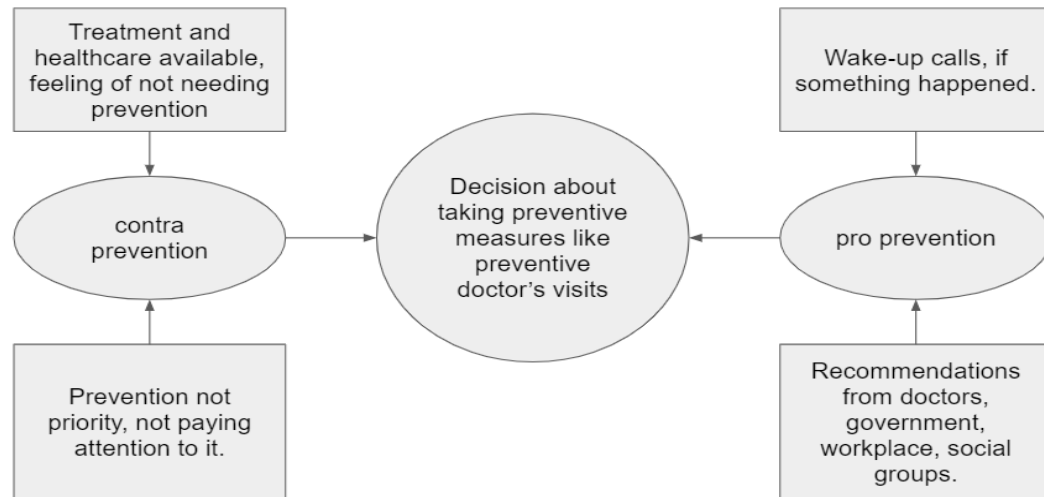
3.1.7. Environment

Most participants did not consciously think about the impact that environment has on their health, although they were aware of the health impacts upon questioning. Only one participant thought that the environment had no influence on his health (A1, p.103). A multitude of different environmental aspects were identified that had both positive, and negative effects on health. The choice of area of living was defined through socioeconomic status and personal decision (A2, p.87; M2, p.49; A2, p.103). Life on the countryside and proximity to nature was perceived as healthier than urban environments (A3, p.121; S2, p. 36, p.104; S1, p.187, p.174; S3, p.48). Further positive environmental influences identified by interviewees were the ability to walk to work and around the neighborhood (A3 p.121-123), low levels of stress (S2, p.40; A2, p.153), and gardening options for organic food (S3, p.21-23, p.33; S2, p.38). Environmental factors that were perceived as having a negative effect on health care were insufficient infrastructure (M2, p.49), noise (S3, p.48; S1, p.185), smell (S3, p.48), overstimulation through electronic devices and media (A2, p.87), and proximity to neighbours (S1, p.176-178, p.183; S3, p.48).

3.1.8. Prevention and vaccination

Most hospital employees participate in some kind of preventive measures. Hospital employees gave different reasons, but most stated that they participate in preventive activities (M1, p.86, p.90; A1, p.227; S2, p.142; S3, p.84; A4, p.8; M3, p.78). The main reasons for preventive measures were the experience of negative key moments and recommendations from third parties. People knew about prevention, but a lot of factors prevented people from participating in preventive measures. One of the main reasons was the availability of treatment, which gave people the impression that preventive measures were not that important (A3, p.115; M2, p.87; M3, p.76). Other factors that prevented people from using preventive measures were financial burdens through prevention (M2, p.69; M3, p.70). Prevention was mostly done because it was either recommended (S1, p.221, p.217-218; A1, p.231), or because people had a general interest in their own health, which was especially the case amongst administrative workers (A1, p.229; A2, p.26, p.28, p.103; A3, p.13; Figure 3.10). During the interviews, it became clear that one of the main reasons for preventive actions were experiences that acted as a key moments or a motivational wake-up call. These experiences caused people to fight their weaker self (M1, p.90; M4, p.10, p.16; A2, p.109).

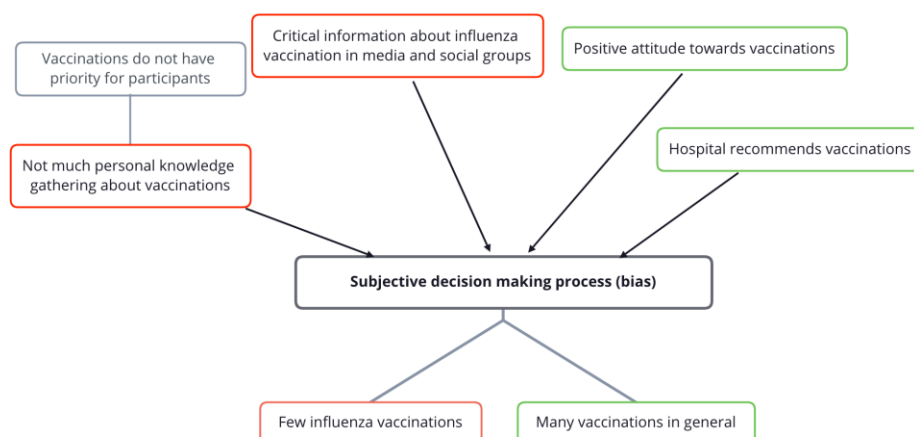
Figure 3.3 Qualitative findings: Prevention in the hospital workforce



Source: Author's own illustration

All hospital employees got at least the basic vaccinations; many had doubts about influenza vaccination. The hospital regularly reminded employees to get vaccinated and sent out a list of recommended vaccinations. For many employees, vaccinations did not seem to be a topic they were thinking about often (A4, p.9: 206; A3, p.119; S1, p.227). The knowledge about vaccination varied strongly amongst participants (A3, p.117; S2, p.138; A4, p.8: 2072). In general, vaccinations were done by employees of all categories, mainly due to the recommendation through the workplace. Most participants of the study had a generally positive attitude towards vaccinations (M3, p.86; S2, p.128; A1, p.219, 221; A2, p.95; M1, p.88; M3, p.70; M2, p.71; Figure 3.11). Influenza vaccination was, however, a controversial topic.

Figure 3.4 Qualitative findings: Vaccination patterns



Source: Author's own illustration

Influenza vaccination was opposed by many hospital employees; the main reason to get vaccinated against influenza was to protect children and elderly people. Influenza vaccination was perceived as not necessary since the flu was not perceived as life-threatening for many employees. An exception to this opinion were medical professionals. Even administrative employees and support staff with a medical training were of the opinion that the flu is not dangerous for them (A3, p.113, M3, p.72; A2, p.97; S2, p.134, p.136; S1, p.125; S3, p.76; A2, p.99). A reason could be the lack of health literacy to differentiate between influenza and the common cold.

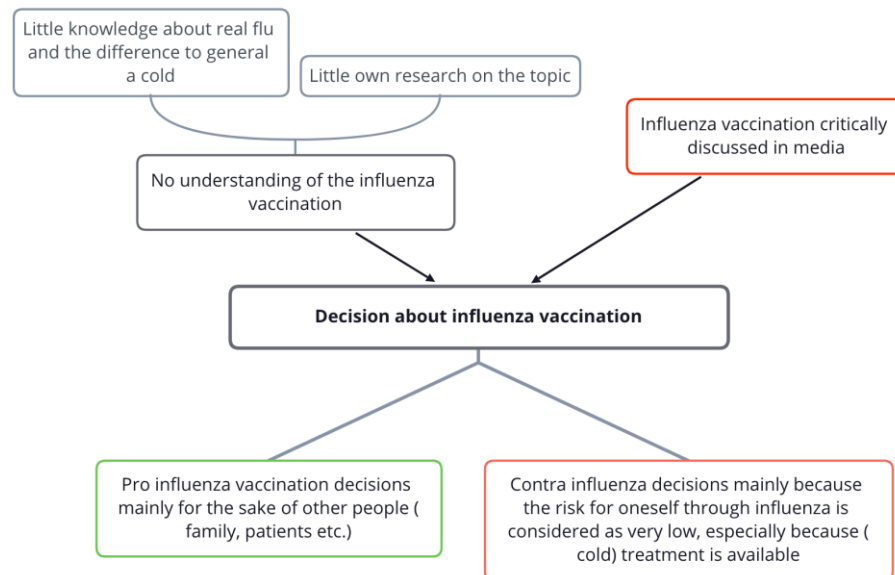
“Well, after it (the flu shot) hit me, I got the flu worse than ever (S1, p.215; author's own translation).”

“There are cases, if you get the flu shot, you'll get the flu much worse. Hence, I prefer to stay home for a week and get it out and then it's done (S2, p.135; author's own translation).”

“Because I rarely have flu. And if so, it just should break out. Then, the body produces its own countermeasures and thus the own immune system becomes much better and stronger than if you vaccinate (S3, p.76; author's own translation).”

“Because every medical doctor who really is a medical doctor says, “If you have flu, you are sick for 7 days without medication. And you are ill for 7 days with medication.” And that is the reality. And fact is, if I have a cold today, I just make myself a real chicken soup (A2, p.97; author's own translation).”

Figure 3.5 Qualitative findings: Influenza vaccination



Source: Author's own illustration

Some employees reported having experienced something they identified as flu, after receiving influenza vaccination (S1, p.215; S2, p.134, p.136). Most hospital workers that were not physicians or nurses opposed influenza vaccination (A3, p.76; S1, p.212; S2, p.131; S3, p. 74; A1, p.225; A2, p.97). Arguments in favor of vaccinations were to protect others, namely elderly people and children (S2, p.136; A1, p.225; A3, p.113; M1, p.88; M2, p.71). The discussion in media and society seemed to be the main reason for opposing the vaccination (S3, p.76; A1, p.221, p.223; S2, p.134; A2, p.97; Figure 3.12).

3.1.9. Media and information

Media is omnipresent and the flood of information causes stress (A1, p.151), impacts the choice of food and other goods (A1, p.42; S1, p.55-56), smoking habits (A1, p.162; A3, p.185; M3, p.46), and vaccination decisions (A1, p.221-223).

"I think, clearly the stress. What I totally underestimate and where I'm also very reluctant, is the extreme flood of information that we are exposed to. Which in my opinion triggers an extreme stress factor in the body. I also see it very often with some acquaintances, relatives or otherwise. If the phone is somewhere and makes "Beep, beep!", "You have received a message", "Yes, so what?". It isn't just gone (if you don't look at it immediately),

so I do not have to jump and check. I am also convinced that much of what concerns health is in the head (A2, p.85; author's own translation)"

It is unclear which information sticks with a person and influences an individual's lifestyle (M2, p.29; A3, p.216). Marketing is perceived as an opponent to health literacy, it has commercial interests, and reaches people through media and influence them (M3, p.28, p.60, p.46; A4, p.13:388-862; A3, p.205-208, p.214-216, p.216, p.225, p.238). The sources of health related information are diverse:

- formal education (S1, p.61),
- documentaries and TV (M1, p.74; M2, p.29),
- information from social contacts (M3, p.18),
- clinicians (S1, p.225; A1, p.190; M3, p.72),
- public health presentations and events (A1, p.132-136; A4, p.1:926-1884, p.2:202-466, p.16:830-1301).

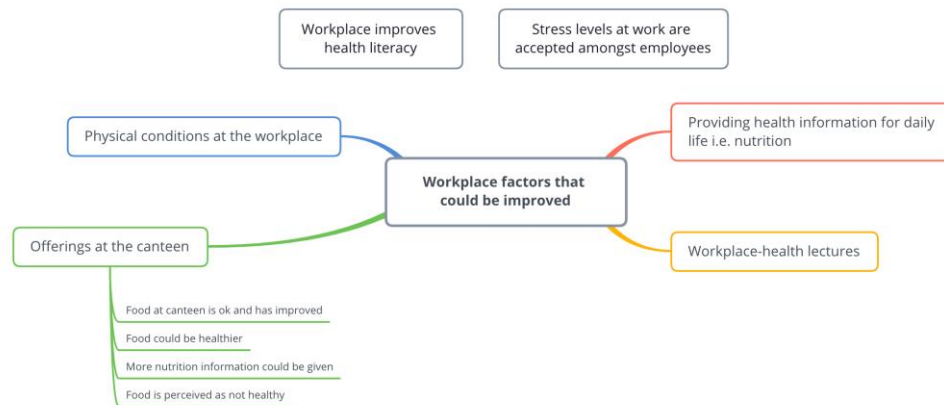
The main source of health related information is, however, the internet (S1, p.61; S2, p.70-74; S3, p.64; A3, p.117). Participants do not possess a set strategy on how to search for information and evaluate sources (A2, p.89-91; A4, p.9:841-950, p.9:1361-1587, p.10:154-461; M3, p.48; M2, p.77-81; A3, p.11, p.117). Most of the time, the decision for a specific source is done intuitively (A4, p.9:1742-1889; M2, p.75). This is mainly due to the perceived difficulty to differentiate sources, their reliability and quality as well as possible interested and intentions behind that source (A1, p.44, p.130-132, p.142, p.188; S1, p.20-22, p.225; A3, p.13). This often results in biased decision making and increases the difficulty of evaluating relevant information (A1, p.136-138, p.44; A4, p.9:1060-1272; S1, p.24, p.67, p.227-233; S2, p.158-160).

3.1.10. Workplace

Hospital employees were of the opinion that their workplace had a positive influence on their health literacy. Participants have expressed that they perceived their work environment to have a positive influence on their health literacy through information they received through their work itself, an exchange of knowledge with co-workers, and hospital initiatives (S1, p.260, p.270, p.274; S2, p.28, p.122, p.12; S3, p.66-70, p.78, p.86; A3, p.199-201; A4, p.14: 614; M1, p.42-43, p.88). The perceived health literacy differed between workers of different departments (M1, p.48-50; A1, p.200; A4, p.15:124-473). Barriers that prevented hospital employees access to healthcare were unwillingness to share own health information at work (S2, p.28), insufficient information initiatives by the employer that would relate to health of employers, including the

understanding of medical terms, and health literacy programs (S2, p.117, p.28, S1, p.278-280; A2, p.15), and little knowledge about healthy workplace options (A1, p.210, p.214). It was further doubted that health literacy impacted one's own workplace-related health (M1, p. 97; A2, p. 21-22).

Figure 3.6 Health related workplace factors



Source: Author's

own illustration

Working in the hospital was perceived as unhealthy (A3, p.125-127; A4, p.11: 480-818; M1, p.65). Some administrative employees and all medical professionals perceived their jobs as stressful, but stress levels were acceptable (A2, p.9, p.162; M1, p.8, p.18, p.95, p.62; M2, p.63; M3, p.62-64). Support employees, on the other hand, perceived their job as physically unhealthy (S1, p.49-51, p.239-244; S2, p.124, p.191; S3, p.78). When it comes to workplace influence on health, the canteen was mentioned most often (Figure 3.13). The food at the canteen was described as average, or alright (S1, p.88-90; S2, p.56-58; S3, p.25; A1, p.54). Diverse offers with healthy options are available at the canteen, according to support staff (S1, p.88; S2, p.56; S3, p.25). Other employees did not evaluate the quality of the food. According to employees, the food had improved since the canteen was renovated, but could be improved further (S1, p.86-88; S2, p.54-56; S3, p.25-27; A1, p.54). The food provided at work was generally perceived as not being beneficial for health (S1, p.84, p.92, p.95; S2, p.58; A1, p.54-56; A2, p.168). Employees without a medical education wished for initiatives by the hospital to improve their health, for example by providing easy to understand information to all employees about workplace health, and information usable in daily life, i.e. nutrition (S1, p.257; S2, p.120, p.164-168, p.174; A1, p.205; A2, p.153). Workplace health (i.e. adjustable tables to prevent back pain) was a topic amongst administrative and medical staff (A1, M2, M3). Employees of all categories knew about sports offers at the workplace. These programs were perceived as the most popular health beneficial

intervention for employees, apart from vaccination programs (S1, p.253-255; S2, p.128, p.193; S3, p.78; A1, p.192-194, p.217-221, p.253; A2, p.164; A4, p.14: 1240-1483; M1, p.42, p.72, p.87; M2, p.87; M3, p.66).

3.1.11. Healthcare system and promotion

The Austrian healthcare system was generally perceived as positive. Evaluations ranged from 'ok' (M2, p.85), over relatively good (A2, p.111) to good (A4, p.15:676-914). It was however also stated that there was an oversupply of healthcare providers in some parts of Austria, which might lower the quality of services provided (A2, 120-124, p.117). The attitude towards clinicians was controversial. On one hand, people had experienced not to be taken seriously by clinicians (S2, p.14, p.20-22), and distrusted medical doctors (S1, p.107; S2, p.14-16, p.22; A2, 26), on the other hand people valued the opinion of doctors and followed their instructions (S1, p.128; S2, p.16, p.148-150; A2, p.105). Negative experiences with the healthcare system seemed to be individual cases. Such cases included: No coverage of insurance for services (A1, p.243; S2, p.177), and negative consequences after surgery (A1, p.239). Participants collected information about health related topics. These included second opinions and alternative treatment options (S1, p.120-126; S2, p.25-26). People knew a few programs that were related to health literacy in Austria. These programs ranged however von non-profit organization lead programs to commercial programs (S1, p. 295-297; A1, p.248; A2, p.126; A4, p.2:1003-1108, p.3:374-429; M2, p.97; M3, p.84).

4. Discussion

4.1. Health literacy and health related behaviour as part of lifestyle

4.1.1. Lifestyle and health literacy

The study identified a gradient of health literacy between different working categories. While 37.5% of medical employees had an excellent health literacy level, only 23.1% of administrative employees and 14.3% of support staff had excellent health literacy. 25% of medical employees had sufficient health literacy, so did 38.5% of administrative employees, and 50% of support staff. The percentage of employees with problematic health literacy was on the other hand very similar in all three categories (37.5%, 38.5%, and 35.7%). Medical employees had the lowest amount of smokers in the three employment categories (6.7%). Only 20% had been smokers in the past, and the rest (73.3%) had never been smoking. The category with most employees with excellent HL hence showed the largest amount of non-smokers. Administrative employees built the middle field in both cases with 53.8% non-smokers, 38.5% former smokers, and 7.7% smokers. As for support staff, this category had both the least amount of employees with excellent health literacy and the fewest non-smokers (30.8%), but instead had most ex-smokers (46.2%) and smokers (23.1%). Similar results were found in vegetable consumption, where medical employees consumed vegetables most frequently, and support staff ate vegetables the least often. According to used quantitative methodology, vegetable consumption was the only lifestyle factor that shows a significant correlation with health literacy. Fruit consumption on the other hand correlated with educational levels. Just like with smoking, administrative employees built the middle field of vegetable consumption. Vaccination habits also showed that most medical employees (87.5%), administrative employees (76.9%) and only 69.2% of support staff were getting all recommended vaccinations (Sattler & Muschnig, 2019).

This could lead to the conclusion that a relationship between health literacy status and healthy lifestyle choices exists. However, this pattern was not consistent for all lifestyle choices. Administrative employees had the best body mass indexes. Support staff, however, did seem to have the least healthy lifestyle, they had the worst BMI with over 45% being overweight. Only 21.4% of support staff consumed fruit 4 or more times per week, compared to 69.3% of administrative employees and 85.7% of medical employees. Even though the pattern did not apply for all areas of lifestyle, health literacy did seem to have an influence on a healthy lifestyle. This correlates with other studies that found that health literacy impacts health through health related behavior (Aby et al., 2017; Osborn et al., 2011; Mozaffarian, 2016). In the qualitative part

of the studies interviewees did argue that the influence of health literacy on conscious lifestyle choices is questionable (A2, p.22-24, p.178; A3, p.61, p.65-69, p.90, p.95-97; M2, p.11). It could, however, be that health literacy subconsciously influences behavior. Not every lifestyle decision has to be consciously influenced by HL. It seems that many interviewees did not think about the impact of their knowledge on their lifestyle choices. A difference in lifestyle cannot only be made by individuals actively choosing to lower risk factors and to increase healthy activities, but HL could in many cases be a precondition to live a healthier lifestyle. The Commission on Social Determinants of Health (2008) stated that health literacy is necessary to enable access to positive health related behaviors, and is an important factor for health equity. This could explain the results of both parts (quantitative and qualitative) of our study. It seems that health literacy influences behavioral choices, but not always consciously. Without sufficient health literacy, the option to make these choices would however not even be possible.

4.1.2. Physical activity

Of 41 participants, 34 (82.9%) participants performed sports regularly. 25 (73.5%) of those with a sports routine fully agreed that one of the reasons for doing sports were the health benefits of physical activity. The other 26.5% stated that they rather agree. None of the participants who did sports regularly disagreed with health benefits being one of the reasons to do sports. Health benefits were however not the only reason to do sports. Improved physical performance (79.4%), perceiving sport as a fun activity (70.6%), and recreational reasons or relaxation (70.6%) were popular amongst participants of the quantitative sequence of this study (Sattler & Muschnig, 2019).

In Austria, 52% of women and 49% of men perform sufficient physical activities to meet the WHO's recommendations. The report does, however, state that physical activity becomes less in age groups over 30 years of age. Since in a hospital few people under the age of 30 work, this might influence the statistic even more (Statistik-Austria, 2015). The interviews in this study found that the main reasons for physical activity were having fun, interest in health benefits, and motivation through the social environment. This matched the answers of the quantitative questionnaire. The questionnaire did however not capture barriers to being physically active. The main reasons named in interviews were medical reasons, lack of motivation, and lack of time. Physical activity was seen as an important determinant of health. The spectrum of sports activities amongst participants reached from performing no activity to being very active. The implementation of sports into a lifestyle was perceived as independent of the knowledge about the importance of physical activity. This connects to other lifestyle changes, which were perceived similarly.

4.1.3. Nutrition

Most interviewees were connecting to health related behavior to nutrition. Every participant of the qualitative study had some ideas of healthy and unhealthy eating habits. The amount of consumption was the most frequently named habit. Large amounts or eating 'too much' of something was generally perceived as unhealthy. Moderation of both the general consumption of food and of different food categories was perceived as healthy behavior. That nutrition is something people immediately relate to health and is perceived as a factor that people can influence to experience an impact on their health coincides with Marion Nestle's (2012) explanation. "Food is something that everybody understands. It's difficult to explain to people how they as individuals can do something about climate change, can do something about international conflicts, can do something about corruption in government. But they can do something about the food they eat. And they should (Nestle, 2012)". Other habits that were perceived as part of healthy nutrition was the practice to cook instead of eating ready to eat meals that are bought and eating fresh food in general. Eating 'too much' and having pleasure snacks once in a while were perceived as unhealthy eating habits. Most people did, however, have these pleasure foods once in a while. While for some eating three oranges at once was already perceived as excessive eating, others stated that they eat large amounts of chocolate. While the idea of a healthy or unhealthy eating habit seems generally known amongst all levels of health literacy, and in all employment categories, the opinions about the details of these habits differed strongly. This could explain differences between subjectively perceived health literacy levels and actual health literacy levels. The interviews showed that amongst all categories of employment the choice to eat healthily seemed not to be different between employment categories. The questionnaires did, however, show great differences between employment categories in the consumption of vegetables and fruits. It is possible that interviewees misjudged their own nutrition. Especially interviewees of the support staff category stated that they do pay attention to a healthy diet, while some medical employees were stating that they do not pay attention to a healthy diet. Different levels of health literacy could be an important factor in this matter. While participants of the category with the lowest health literacy stated that they pay attention to eating healthy, even if not always successfully, some participants of the employment category with the highest HL explained that they do not particularly pay attention to eating healthy. The ability to judge one's own nutrition and reflect on it critically (Nutbeam, 1998) is part of health literacy. This could be an important part of possible policies or incentives at hospitals. Giving employees an option to evaluate their nutrition could help them understand their habits and the room for improvement. While the opinion to have a general knowledge of a healthy diet seems to be in place, the ability to evaluate one's own diet seems to be misjudged.

In the Austrian population, 66% of women and 45% of men consumed fruit on a daily basis. Vegetables were consumed by 55% of women, and 40% of men daily. Men did, however, eat meat more often than women. 39% of men ate meat daily, compared to only 19% of women (Statistik-Austria, 2015). Of the participants of our study, 26.8% consumed fruits daily, 35.7% ate vegetables every day, and 32.6% ate meat daily. Both, fruit and vegetable consumption of the hospital workforce is below the Austrian average. Administrative employees ate more fruit daily (38.5%) than the medical employees (35.7%), or support staff (7.1%). 46.7% of medical employees are the only category within the hospital workforce who's vegetable consumption is within the Austrian average. The numbers of fruit and vegetable consumption were significantly lower, than the Austrian average. Meat consumption on the other hand above average. Especially the lack of fruits and vegetables in the daily diet of hospital workers can be considered as unhealthy behavior (Sattler & Muschnig, 2019).

Only 7.7% of support staff (0% in other categories) stated that they found it fairly difficult to find information about healthy activities such as diet and nutrition. That 92.3% of support staff and 100% of other categories have no problems with finding information on this topic is noteworthy (Sattler & Muschnig, 2019). The consumption of vegetables and fruit on a daily basis is not given for most participants. The interviews give two possible explanations (Sattler & Muschnig, 2019). One explanation is that information is found but misunderstood. Multiple interviewees stated that nutrition is complicated. The literacy to evaluate what kind of foods in which amounts are healthy, or unhealthy is essential for a healthy diet (CSDH, 2008). The sources through which interviewees obtain their information are very diverse. The Internet is one of the main sources. The evaluation and identification of reliable sources are however usually subjective amongst all employment categories. Sometimes it is not rational, which information stays in a person's mind and has an effect on its behavior, according to our qualitative research. Another explanation of why it seems not difficult for participants of the questionnaire to find information about healthy diets while the actual diets look however not healthy is a lack of motivation. In the evaluation of health literacy, the aspect of motivation is difficult to evaluate. Motivation is, however, an important part of HL (Nutbeam, 1998; Sørensen et al., 2012). This study has identified motivation in other aspects of the lifestyle as a critical factor. This proves the theory that motivation has an impact on self-care (Paasche-Orlow & Wolf, 2007).

For many employees, the hospital canteen is an integral part of their daily diet. Many employees found that the food had improved after the renovation of the canteen, but could still be improved

further. According to participants, healthy options were available. Side dishes contained vegetables and were served every day. The European Health Literacy Survey Questionnaire indicated however that 50% of support staff at the hospital eat vegetables less than four times per week. For administrative employees, the amount of people consuming this few vegetables is only half as large (23.1%) and only 6.7% of medical employees eat vegetables less than 4 times per week. The option to eat vegetables is given at the hospital canteen, but not used by every department equally (Sattler & Muschnig, 2019).

The canteen might be an opportunity as a point of contact to provide health relevant information to employees and by doing so improving their health. As discussed above, health literacy can also subconsciously influence behavior. Providing information to improve employees' HL could result in healthier nutrition. The canteen is perceived by employees as a part of their work environment that has a strong impact on their nutrition and subsequently on their health. The way this kind of information is presented is however essential. In the health literacy questionnaire understanding a nutritional label is part of the questions to evaluate health literacy, which is done to test the functionality of HL (Sørensen et al., 2012). Some health literacy scores were however critical. Our results showed the functional health literacy of understanding nutritional labels differed significantly between different employment groups. 36% of support staff showed a high likelihood of having limited health literacy in this context. Nutritional labels on food were mostly discounted, and a lack of interest in the information provided by these labels was present. Not only were nutritional labels on packaging perceived as difficult to understand, but people were also displaying a lack of interest in the nutritional values of purchased goods. The taste of a product was, according to our findings, more important than the nutritional value. If nutritional information would be provided, it would have to be in an easy to understand way. An easy to understand rating system such as the health star rating in Australia was suggested by one of our interviewees (Dunford, Wu, Wellard-Cole, Watson, Crino, et. al., 2017). The system is easy to understand and does not require reading. It teaches people which foods are healthier than others.

4.1.4. Smoking

In the hospital workforce, only 12.2% were smokers, which equals about half of the amount of smokers in the general population (men 27%, women 22%). The share of ex-smokers amongst hospital workers was 34.1%, which is higher than among the general population in Austria (29% men, 21% women) (Sattler & Muschnig, 2019). The amount of non-smokers that never have been smoking was slightly higher than in the Austrian population (39% men, 52% women) (Statistik-Austria, 2015). The difference in the percentage of smokers amongst employment categories was

not significant in this study. The amount of ex-smokers contradicts the findings of a study that states that hospital workers have a predisposition to relapse into smoking habits (Bautista-Rentero et al., 2014). Qualitative findings indicate that smoking is generally perceived as an unnecessary habit, which is very difficult to quit. Social pressure and the general acceptance of smoking as an activity were the main reasons why people started smoking. Over the years the image of smoking shifted, which is partly to the ban of smoking advertisements. Yet, smoking is still perceived as 'cool' and in the media, smoking is promoted as an attractive habit. However, this picture has been changing over the past years, and the tendency is to perceive healthy, sportive people as 'cool'. This shift of the perception of smoking may be related to the health literacy about this specific determinant of health, as indicated by the Commission on Social Determinants of Health (2008) it is a problem that has been addressed and needs to continue being addressed in societies. Smoking is one of the most dangerous social determinants of health and responsible for millions of deaths (WHO, 2009).

“Politically, medially and culturally. If you are not allowed to smoke in films then this “coolness factor” will be eliminated. That then shifts elsewhere. Then it’s no longer the smoking cool guy on the bike, but the athlete, who is just coming out of the swimming pool - wet (M3, p.46).”

4.1.5. Alcohol consumption

Around four out of five hospital workers had consumed alcohol in the past year (the number amongst the work categories were similar). 29.4% of those had consumed alcohol one or more times per week. Over the past 12 months, 23.1% of medical employees, 27.3% of administrative, and 40% of support staff drunk once or more per week. With only 15.2% drinking more than two drinks on a day when they were drinking, the alcohol consumption amongst hospital workers was moderate compared to the consumption of alcohol in the Austrian population. However, the amount of people that had been drinking alcohol during the past 12 months was nearly identical in the hospital workforce and the Austrian population. 10% of Austrian men are drinking daily, while only 3% of women drink on a daily basis (Statistik-Austria, 2015). In our study, only one person (3.6%) was drinking alcohol daily. Twice as many men (42%) than women (21%) drink more than two alcoholic drinks per week (Statistik-Austria, 2015). It is therefore important to notice that most participants in our study (71.4%) were male (Sattler & Muschnig, 2019).

It is therefore arguable that even though the percentage of male participants was higher, and men consume more alcohol than women according to Statistik-Austria (2015), that the actual alcohol

consumption average within the hospital is even lower than our findings suggest. This contradicts studies that stated that alcohol consumption amongst hospital workers is higher than in the general population. “Moderate-to-heavy alcohol consumption was more common among health professionals in recent years and increased from 19.5% in 2005 to 23.2% in 2013, with a similar increase observed in other occupations (17.9% to 20.1%) (Dayoub and Jena, 2015).” Noteworthy is that alcohol consumption in the hospital workforce is generally lower than in the Austrian population. Health concerns were the main reason not to drink alcohol, as stated in the interviews. This opinion concurs with many studies that state the dangers of alcohol consumption (WHO, 2015; Darnton-Hill, 2002; Bauer, 2014). Factor that influenced alcohol drinking were other lifestyle choices that contradicted the consumption of alcohol. Especially the habit to get around by car, and frequent physical exercise prevented people from drinking. The interrelation of social determinants of health becomes clear, even amongst the lifestyle choices of an individual. These findings consent with statements of many other studies about SDH, describing the interrelation of determinants (Mantwill, Monestel-Umaña, & Schulz, 2015; Braveman, 2014; CSDH, 2008). The qualitative research confirmed the quantitative findings that describe a moderate to low alcohol consumption amongst the hospital workforce. We further found that the occasions on which people drink are nearly exclusively social occasions. On such occasions the wide acceptance and cultural status of drinking alcohol cause people to drink. This is either experienced as peer pressure or as creating a cozy atmosphere.

4.1.6. Correlation between health literacy and lifestyle choices

Health literacy and lifestyle influence one another. Our questionnaire findings describe that health literacy has an impact on health related behavior and therefore on lifestyle, which concurs with other studies (Aby et al., 2017; Osborn et al., 2011; Mozaffarian, 2016). The interviews did, however, find that health literacy only enables people to influence their behavior, but not that it automatically does have an influence without the individual's interest or motivation. Paasche-Orlow & Wolf (2007) too suggested that motivation plays an important role in the process in which health literacy influences health through behavior.

Medical employees and administrative employees evaluated their subjective health as good (MED 61.5%, ADM 54.5%) or very good (MED 23.1%, ADM 36.4%), very few evaluated their health as fair (MED 15.4%, ADM 9.1%) (Sattler & Muschnig, 2019). Support staff, however, had a more ordinary distribution with 37.5% fair, 37.5% good, and 25.0% very good (Sattler & Muschnig, 2019). This shows that subjective health is lower amongst support staff than amongst the rest of the hospital workforce. Amongst participants the opinions whether health literacy does or does

not impact their lifestyle drifted apart. The study found that health literacy enabled people to make lifestyle decisions which they would not be able to do without HL. These results concur with the findings of other studies (Berkman 2004, Rudd, 2010). Choices can be based on health literacy, but having the option does not always result in using the knowledge one possesses. During interviews, it became clear that the decision on which information one takes into account for the decision-making process is by tendency for most people done by gut feeling, rather than objective evaluations. Even random information from all kinds of sources may initiate a change of behavior according to the findings of our qualitative study segment.

“At some point, it was said that if you do not smoke until 25, that was probably in a Bravo magazine or something, that if you do not smoke until 25, then you will no longer get addicted. Then I thought with 20 or so, that’s total bullshit and have never started because of it. At some point, I thought then actually it is cool that I have never smoked and have told myself: ‘well then, I do not start now (M2, p.29; author’s own translation)”

According to our qualitative research, two main circumstances encourage the active use one’s health literacy to initiate behavioral change. The first reason was an internal motivation, which concurs with Paasche-Orlow & Wolf (2007). Our study could however not identify how this motivation is created. Some people had it, no matter their health literacy, from a young age, while others developed it later in life. The second reason for the change was something we defined in our study as wake-up calls or key experiences. Most experiences that we would call key experiences, changed a person’s lifestyle by changing its values. Values are, according to Veal (1993), besides actions important components of lifestyle. These key experiences are usually negative experiences that lead a person to overcome their weaker self and initiate change. Without a pre-existing motivation to live healthily, or such a wake-up call, it seems, according to our findings, that it would be difficult to bring people to change their lifestyle. While health literacy enables change, it is the motivation that initiates a change of health related behavior. The definition “the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions” (Ratzan & Parker, 2000) seems therefore according to our own findings incomplete. The definition by the WHO includes the motivational aspect of health literacy, which is an imperative component of applicable health literacy. “the cognitive and social skills which determine the motivation and ability of individuals to gain access to, understand and use information in ways which promote and maintain good health (Nutbeam, 1998).”

4.1.7. Influence of health literacy on lifestyle choices and health

Health literacy and its relation to lifestyle, in particular, the lifestyle of participants, is perceived subjectively (Folake, 2015). This research shows that health literacy had an impact on health related behavior, as described in other studies. As mentioned above, health literacy enables lifestyle choices but does not necessarily have a direct impact on behavioral changes (Berkman 2004). The importance of health literacy for patients is known. Health literacy related to work is a concept which does make sense, but many have not thought about it. Finally, health literacy for one's own lifestyle is believed to enable access to decision making about a healthy lifestyle, but the influence of HL on one's own lifestyle choices is questioned. A healthy lifestyle is a pattern of many lifestyle decisions and activities (Veal, 1993). Health literacy might have enable people to make literate decisions but did not initiate changes. Motivation and interest in health, not knowledge result in lifestyle changes. General interest and motivation, or key events that caused a person to conquer the weaker self were an integral part of healthy lifestyle decisions. Generally, people trusted more in their gut feeling, than in technology. Knowledge about health risks, and therefore health literacy was the main reason to quit smoking and to drink less alcohol. Other determinants either supported health literate decisions, for example, a sportive lifestyle supports the notion to drink less alcohol since alcohol interferes with physical abilities or contradicted health literate decisions. Socioeconomic status had an impact on the food one could afford, and social pressure and media influenced decisions as well. To conclude, health literacy was perceived as an important basis to make healthy lifestyle decisions, but motivation and interest were the initiators of change.

5. Strengths and limitations

“This study has several limitations. **One major limitation of this study was its small sample size.** The study planned to recruit at least five hospitals in Austria for result comparison. However, due to low response rate, organisational barriers and a lack of willingness to participate in the study, the sample was collected in only one regional hospital. The outcome is therefore a case study, which is not generalizable or representative of the Austrian hospital workforce. The statistical validity of the quantitative findings and correlations is also limited due to small sample size within the hospital. A factor that might have contributed to low response rate and high participant drop-out was the length of the questionnaire (Burchell & Marsh, 1992). However, the detailed investigation was imperative for answering the defined research questions and assisted in preparing the interview questions. Questions about sociodemographics like household income were answered by a smaller share of participants. The same has been observed in the European health literacy survey (Pelikan & Ganahl, 2017). Additionally, the small sample size in our interviews did not allow a comparison of health related lifestyle choices between different employment groups. A detailed look at the health related lifestyle choices of support staff compared to the employment groups with more educational background did not result in significant findings. To identify lifestyle choices specific to individual employment groups, more than three representatives of each category should be interviewed. Further studies with a larger sample size and more interview participants would be necessary to identify lifestyle patterns that extend the findings presented in this paper. Qualitative data was therefore summarised for the entire hospital workforce, irrespective of employment category (Sattler & Muschnig, 2019).”

“Another limitation is the participant selection bias. **Participant selection was coordinated by the hospital director, who instructed the heads of different employment groups to send the questionnaire to willing participants.** Support staff response rate was extraordinarily low upon the first distribution of the survey, wherefore the survey was sent out repeatedly to this group. Previous research has found that response rates in health surveys often correlate with educational level and social class (Sonne-Holm, Sørensen, Jensen, & Schnohr, 1989 in Sattler & Muschnig, 2019).”

“Socio-demographics of our sample are not representative for the investigated hospital. Gender distribution was uneven since most participants were male. This was the case among all employment categories, and data was not weighted due to small sample size. In contrast to our sample, more than 70% of the employees of the investigated hospital were female. It is not entirely

clear why this distribution was the other way around in our sample. One of the reasons might be that about two thirds of the hospital employees work in nursing (Pflege), and our sample did not reflect the weights of different employment categories. In order to get comparable numbers, we aimed to include the same amount of employees from all three employment categories. However, most of the hospital employees actually work in nursing, and smaller amounts in administration or supporting functions. The share of part-time workers in our study sample was also smaller in our study group than in the overall hospital (12% vs 42%). All of the study participants who declared a nationality were Austrian. Therefore, the cultural or language barriers observed in other studies could not be investigated. Migrational status, language barriers and culture are often associated with lower health literacy (Biyikli Gültekin, 2017; Peláez, Hendricks, Merry, & Gagnon, 2017; Quenzel, Schaeffer, Messer, & Vogt, 2015). In the overall hospital, workers from 52 nations collaborate in more than 100 employment groups. In our study sample however, there were only two participants with one parent born within the European Union, while all other parents were Austrian. This bias might further have contributed to comparably higher health literacy levels than could be expected in the overall hospital population. One reason for this might have been the biased participant selection and the fact that several services (e.g. cleaning) were performed by external service providers. Hence, this data is not representative for the investigated hospital (Sattler & Muschnig, 2019)."

"Methodological limitations have to be considered in the interpretation of our study outcomes. **All relationships investigated are purely correlational and do not represent any causal evidence.** The influence of socioeconomic variables on lifestyle factors was considered using multifactorial regression analysis. Structural and time pressure might have caused response bias, since the questionnaire was filled out during the participant's work time. The online format of the test also limits comparability with the Austrian population, since the survey was conducted as computer-assisted or paper-assisted personal interviews (PAPI) in this population (Sattler & Muschnig, 2019)."

"This study also has several strengths. **To our knowledge, this is the first study investigating the health literacy levels of hospital employees in Austria.** Since patients are in contact with hospital employees of all kinds, this study gives a thorough insight on all employees that are fundamental to forming a health literate organisation. Another strength was the use of a detailed, validated questionnaire that has been tested in an Austrian population before. Inclusion of the HLS-EU-Q and NVS test provided a comprehensive image of hospital employees' health literacy levels, covering different aspects. The combination of quantitative and qualitative data allowed for

a deeper investigation of the reasoning behind the answers that were given. This further contributed to the understanding of employee motivation, belief and attitude (Sattler & Muschnig, 2019).”

6. Conclusion

In brief, this case study has shown that the subjective health literacy amongst hospital employees is higher than amongst the general population in Austria. The perceived access to information and a learning environment that supports the exchange of knowledge is perceived as having a positive effect on employees' health literacy. However, one third of hospital employees in all three employment categories had problematic health literacy scores (Sattler & Muschnig, 2019).

“Barriers in patient-provider communication in our sample were the same as previously observed in non-hospital workers. Personal beliefs and experience were the main factors that determined the use of preventive services, such as cancer screenings or vaccination offers. The fear of side effects was an essential barrier, which has the potential to be overcome with information that is provided in an understandable and user-friendly way, in accordance with health literacy guidelines. The same is true for the perceived low risk of self-infection or disease (Sattler & Muschnig, 2019).”

Lifestyle changes are made mainly because a general motivation and interest to live healthy is already present, in which case new information about healthy lifestyle choices may cause a change in people's health related behaviours. The second reason that causes change in lifestyle are key moments that show people the consequences of health related behaviours. “Health literacy enables people to make healthier lifestyle choices, there was however no correlation found between high levels of health literacy and choosing healthier lifestyle. Key moments were often cause to a change of lifestyle. The exchange of knowledge in different areas of lifestyle could benefit employee health. Programs at the workplace that encourage exchange of knowledge would involve employees with their workplace and might benefit their health through improved health literacy. A special focus should be on nutrition information, since the study has shown that nutrition is a topic that is more easily accessible for participants than many other health related topics. Smoking bans and advertisement regulations show that such initiatives are effective. Similar regulations on food advertisement, or generally for products that are proven to be unhealthy are possible (Sattler & Muschnig, 2019).” Smoking, and alcohol consumption are mainly reduced due to health-related reasons, main reasons for the consumption are related to the social environment of participants, and social pressure. Nutrition and physical activity were the two points participants were associating the easiest to health-related lifestyle choices.

“Based on the above mentioned research outcomes, three key areas for improvement are suggested (Sattler & Muschnig, 2019)”:

- 1) “easier navigation in the healthcare system (Sattler & Muschnig, 2019)”
- 2) “more emphasis on HL education (in schools, universities and for adults) (Sattler & Muschnig, 2019)”
- 3) “fostering HL at an organisational level (Sattler & Muschnig, 2019)”

Improvement of health literacy requires identifying points of contact, through which people's literacy, and motivation can be increased. Not all points of contact are equally accessible for people. “To make the health system easier to navigate, information has to be provided in a better way. Non-difficult and illustrated messages can enhance understanding and facilitate better informed-decision making (Meppelink, Smit, Buurman, & van Weert, 2015). Present results show that an interest in further educational programs on the topic exists. Health literacy education is an essential cornerstone that can contribute to forming health literate societies of the future (Kickbusch et al., 2013). One way to enhance organisational health literacy is by implementing an organisational health literacy advocate (Parker, 2009). Lessons about health literate organisations and collaborations can be learned from trailblazers such as the Stoke-on-Trent health literacy strategy, Carolinas Healthcare System (CHS), Intermountain Healthcare, or Northwell Health (Brach, 2017; Estacio, Oliver, Downing, Kurth, & Protheroe, 2017). However, health literacy is a young field of research and the best methods to promote HL will still have to be evaluated (D'Eath, Barry, & Sixsmith, 2012). The next health literacy survey in the Austrian population, which is planned in 2019, will provide more up-to-date data for comparison with our results and first insights into the effects of implemented policies. The observed difference between self-perceived and functional health literacy and difficulty in the interpretation of results highlight the need for better tools for measuring health literacy. Further research should focus on the development of health literacy tools that measure comprehensive health literacy in a reliable yet easily applicable way, which can capture the effect of organizational and governmental policies. The correlation of health literacy and lifestyle choices is still not fully understood. Further research into the topic of the recurring phenomena of key experiences that change people's values and actions towards healthier behaviour, and the source of general interest in health is recommended by the authors of this study. Research in the area of occupation specific health literacy is needed to get a deeper understanding of the effect of work environment on health. Additional studies should be expanded to a more representative sample of the Austrian hospital workforce (Sattler & Muschnig, 2019).”

7. References

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Annex

A1 Questionnaire	A1
A2 Interview guideline	A16
A3 Ethics approval	A19
A3.1 Informed consent forms	A22
A4 Results	A25

A1 Questionnaire

Sehr geehrte Teilnehmerinnen und Teilnehmer,

vielen Dank, dass Sie sich die Zeit nehmen und bereit sind, an dieser Umfrage teilzunehmen!

Diese Umfrage beschäftigt sich mit der Gesundheitskompetenz von Krankenhausangestellten verschiedener Arbeitsbereiche. Die Umfrage ist Teil eines Masterarbeitsprojekts im Studiengang International Health and Social Management am Management Center Innsbruck, welches die drei folgenden Fragestellungen untersucht:

- 1) Wie gesundheitskompetent sind Krankenhausangestellte?**
- 2) Wie unterscheiden sich Gesundheitskompetenzlevels in den verschiedenen Gruppen von Krankenhausangestellten?**
- 3) Wie ist der Zusammenhang zwischen Gesundheitskompetenzlevels und Lebensstilentscheidungen?**

Im Rahmen des Projekts wird ein online Fragebogen ausgefüllt und mit einigen der Teilnehmer weiterführende Interviews durchgeführt. Die Ergebnisse unserer Studie werden im Juni in Form einer Masterthesis am MCI eingereicht, im September verteidigt und gegebenenfalls danach in einem Magazin veröffentlicht.

Wir bedanken uns herzlich für Ihre Teilnahme an der Umfrage!

Rico Sattler & Tanja Muschnig

Die Teilnahme an der Studie ist absolut FREIWILLIG und ANONYM.

Teil A: Anstellungskategorie

A1. Welcher Kategorie Angestellter gehören Sie an?

Medizinisches Personal (Ärzte, Krankenpfleger, Hospizarbeiter, Notfallversorger und andere ausgebildete Versorgungshelfer)

Administrationsangestellte (Management, Bürokräfte, Personalmanager, Finanzangestellte, Sachbearbeiter, weitere Büroangestellte)

Hilfskräfte (Patientenservice Assistenten, Putzkräfte, Träger etc.)

☐
☐
☐

A2. Welcher Anstellung gehen Sie genau nach?

Arzt/Ärztin

Krankenpfleger/in

Hospizarbeiter/in

Notfallversorger/in

ausgebildete/r Versorgungshelfer/in

Sonstiges

☐
☐
☐
☐
☐
☐
☐

Sonstiges

A3. Welcher Anstellung gehen Sie genau nach?

Manager/in

Büroangestellte/r

Personalmanager/in

Finanzangestellte/r

Sachbearbeiter/in

Sonstiges

☐
☐
☐
☐
☐
☐

Sonstiges

A4. Welcher Anstellung gehen Sie genau nach?

Patientenservice Assistent/in	<input type="checkbox"/>
Putzkraft	<input type="checkbox"/>
Träger/in	<input type="checkbox"/>
Sonstiges	<input type="checkbox"/>

Sonstiges

Teil B: Gesundheitskompetenz

Die nächsten zwei Abschnitte beschäftigen sich mit Fragen zu Ihrer Gesundheitskompetenz.

B1. Auf einer Skala von sehr einfach bis sehr schwierig: Wie einfach ist es Ihrer Meinung nach:

	Sehr einfach	Ziemlich einfach	Ziemlich schwierig	Sehr schwierig
... Informationen über Krankheitssymptome, die Sie betreffen, zu finden?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über Therapien für Krankheiten, die Sie betreffen, zu finden?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... herauszufinden, was im Fall eines medizinischen Notfalls zu tun ist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... herauszufinden, wo Sie professionelle Hilfe erhalten, wenn Sie krank sind? (z.B. Arzt, Apotheker, Psychologe)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu verstehen, was Ihr Arzt Ihnen sagt?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... die Packungsbeilagen/Beipackzettel Ihrer Medikamente zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu verstehen, was in einem medizinischen Notfall zu tun ist?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... die Anweisungen Ihres Arztes oder Apothekers zur Einnahme der verschriebenen Medikamente zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, inwieweit Informationen Ihres Arztes auf Sie zutreffen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Vor- und Nachteile von verschiedenen Behandlungsmöglichkeiten zu beurteilen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, wann Sie eine zweite Meinung von einem anderen Arzt einholen sollten?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, ob Informationen über eine Krankheit in den Medien vertrauenswürdig sind? (z.B. Fernsehen, Internet oder andere Medien)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... mit Hilfe der Informationen, die Ihnen der Arzt gibt, Entscheidungen bezüglich Ihrer Krankheit zu treffen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... den Anweisungen für die Einnahme von Medikamenten zu folgen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... im Notfall einen Krankenwagen zu rufen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... den Anweisungen Ihres Arztes oder Apothekers zu folgen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über Unterstützungsmöglichkeiten bei ungesundem Verhalten, wie Rauchen, wenig Bewegung oder zu hohem Alkoholkonsum, zu finden?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über Unterstützungsmöglichkeiten bei psychischen Problemen, wie Stress oder Depression, zu finden?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über empfohlene Impfungen und Vorsorgeuntersuchungen zu finden? (z.B. Krebsfrüherkennung, Blutzuckertest, Blutdruck)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen darüber zu finden, wie man bestimmte Gesundheitsrisiken vermeiden oder damit umgehen kann, wie Übergewicht, hoher Blutdruck oder hoher Cholesterinspiegel?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Gesundheitswarnungen vor Verhaltensweisen wie Rauchen, wenig Bewegung oder übermäßiges Trinken zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu verstehen, warum Sie Impfungen brauchen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu verstehen, warum Sie Vorsorgeuntersuchungen brauchen? (z.B. Krebsfrüherkennung, Blutzuckertest, Blutdruck)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, wie vertrauenswürdig Gesundheitswarnungen sind, z. B. Warnungen vor Rauchen, wenig Bewegung oder übermäßigem Trinken?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, wann Sie einen Arzt aufsuchen sollten, um sich untersuchen zu lassen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, welche Impfungen Sie eventuell brauchen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Teil C: Gesundheitskompetenz II

C1. Auf einer Skala von sehr einfach bis sehr schwierig: Wie einfach ist es Ihrer Meinung nach:

	Sehr einfach	Ziemlich einfach	Ziemlich schwierig	Sehr schwierig
... zu beurteilen, welche Vorsorgeuntersuchungen Sie durchführen lassen sollten?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, ob die Informationen über Gesundheitsrisiken in den Medien vertrauenswürdig sind? (z.B. Fernsehen, Internet oder andere Medien)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu entscheiden, ob Sie sich gegen Grippe impfen lassen sollten?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... aufgrund von Ratschlägen von Familie und Freunden zu entscheiden, wie Sie sich vor Krankheiten schützen können?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... aufgrund von Informationen aus den Medien zu entscheiden, wie Sie sich vor Krankheiten schützen können? (z.B. Zeitungen, Broschüren, Internet oder andere Medien)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über gesundheitsfördernde Verhaltensweisen, wie Bewegung und gesunde Ernährung, zu finden?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen über Verhaltensweisen zu finden, die gut für Ihr psychisches Wohlbefinden sind? (z.B. Meditation, körperliche Bewegung, Spaziergehen, Pilates etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen zu finden, wie Ihre Wohnumgebung gesundheitsförderlicher werden könnte? (z.B. Minderung der Lärm- und Schadstoffbelastung; Schaffung von Grünflächen, Freizeiteinrichtungen)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... etwas über politische Veränderungen herauszufinden, die Auswirkungen auf die Gesundheit haben könnten? (z.B. Gesetzgebung, neue Vorsorgeprogramme, Regierungswechsel, Gesundheitsreformen etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... sich über Angebote zur Gesundheitsförderung am Arbeitsplatz zu informieren?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Gesundheitsratschläge von Familienmitgliedern oder Freunden zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Angaben auf Lebensmittelverpackungen zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen in den Medien darüber, wie Sie Ihren Gesundheitszustand verbessern können, zu verstehen? (z.B. Internet, Zeitungen, Zeitschriften)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Informationen darüber, wie Sie psychisch gesund bleiben können, zu verstehen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, wie sich Ihre Wohnumgebung auf Ihre Gesundheit und Ihr Wohlbefinden auswirkt? (z.B. Ihre Gemeinde, Ihre Nachbarschaft)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, wie Ihre Wohnverhältnisse dazu beitragen, dass Sie gesund bleiben?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... zu beurteilen, welche Alltagsgewohnheiten mit Ihrer Gesundheit zusammenhängen? (z.B. Trink- und Essgewohnheiten, Bewegung etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Entscheidungen zu treffen, die Ihre Gesundheit verbessern?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... einem Sportverein beizutreten oder einen Sportkurs zu belegen, wenn Sie das wollen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... Ihre Lebensverhältnisse, die Auswirkungen auf Ihre Gesundheit und Ihr Wohlbefinden haben, zu beeinflussen? (z.B. Trink- und Essgewohnheiten, Bewegung etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... sich für Aktivitäten einzusetzen, die Gesundheit und Wohlbefinden in Ihrer Umgebung verbessern?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Teil D: Gesundheitsdaten

D1. Wie ist Ihr Gesundheitszustand im Allgemeinen?

Sehr gut	<input type="checkbox"/>
Gut	<input type="checkbox"/>
Mittelmäßig	<input type="checkbox"/>
Schlecht	<input type="checkbox"/>
Sehr schlecht	<input type="checkbox"/>

D2. Wie zufrieden sind Sie mit Ihrer Gesundheit?

Sehr zufrieden	<input type="checkbox"/>
Zufrieden	<input type="checkbox"/>
Weder zufrieden noch unzufrieden	<input type="checkbox"/>
Unzufrieden	<input type="checkbox"/>
Sehr unzufrieden	<input type="checkbox"/>

D3. Wie würden Sie Ihre Lebensqualität beurteilen?

Sehr gut	<input type="checkbox"/>
Gut	<input type="checkbox"/>
Mittelmäßig	<input type="checkbox"/>
Schlecht	<input type="checkbox"/>
Sehr schlecht	<input type="checkbox"/>

D4. Haben Sie irgendeine lang andauernde Krankheit oder ein lang andauerndes gesundheitliches Problem? Mit lang andauernd meine ich Probleme, die bereits 6 Monate oder länger andauern oder von denen Sie annehmen, dass sie so lange dauern werden.

Ja, mehr als eine	<input type="checkbox"/>
Ja, eine	<input type="checkbox"/>
Nein	<input type="checkbox"/>

D5. Wenn Sie zumindest an die letzten 6 Monate zurückdenken, wie stark haben Ihre gesundheitlichen Probleme Ihre üblichen Aktivitäten eingeschränkt?

Erheblich eingeschränkt	<input type="checkbox"/>
Eingeschränkt, aber nicht erheblich	<input type="checkbox"/>
Überhaupt nicht eingeschränkt	<input type="checkbox"/>

D6. Wie sind Sie krankenversichert?

Gesetzlich	<input type="checkbox"/>
Gesetzlich und privat	<input type="checkbox"/>
Privat	<input type="checkbox"/>
Gar nicht	<input type="checkbox"/>

D7. Wie oft mussten Sie ...?

	0	1 - 2 mal	3 - 5 mal	6 mal oder öfter
... in den letzten zwei Jahren den ärztlichen Notfalldienst in Anspruch nehmen? (z.B. Krankenwagen, Bereitschaftsdienst, Notaufnahme)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... in den letzten 12 Monaten einen Arzt aufsuchen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... in den letzten 12 Monaten als Patient ins Krankenhaus?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
... in den letzten 12 Monaten Dienstleistungen von anderen medizinischen Fachleuten, wie z.B. Zahnarzt, Physiotherapeut, Psychologe, Diätassistent oder Optiker, in Anspruch nehmen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

D8. Wie ist Ihre generelle Einstellung zum Impfen?

- Empfohlene Impfungen nehme ich in der Regel wahr ☐
- Einzelne empfohlene Impfungen habe ich nicht durchführen lassen, lehne sie aber auch nicht ab ☐
- Ich lehne Impfungen grundsätzlich ab ☐
- Ich lehne einzelne Impfungen bewusst für mich ab ☐

D9. Welche Impfungen lehnen Sie bewusst für sich ab?

- Wundstarrkrampf (Tetanus) ☐
- Keuchhusten (Pertussis) ☐
- Grippe (saisonale Influenza) ☐
- Masern ☐
- Ich lehne keine der genannten Impfungen grundsätzlich ab ☐
- Sonstiges ☐

Sonstiges

Teil E: Lebensstil Daten

E1. Welche der folgenden Aussagen trifft auf Sie in Bezug auf das Rauchen von Zigaretten, Zigarren oder Pfeifen zu?

- Sie sind Raucher ☐
- Sie haben früher geraucht, aber damit aufgehört ☐
- Sie haben nie geraucht ☐

E2. Rauchen Sie die folgenden Tabakprodukte täglich, gelegentlich oder niemals?

- | | Ja, täglich | Ja, gelegentlich | Nein, nie |
|---------------------------|--------------------------|--------------------------|--------------------------|
| Filterzigaretten | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Selbstgedrehte Zigaretten | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

E3. Haben Sie während der letzten 12 Monate Alkohol getrunken, also Bier, Wein, Spirituosen, Apfelwein oder andere alkoholische Getränke?

- Ja ☐
- Nein ☐

- E4. Wie oft haben Sie in den letzten 12 Monaten 5 oder mehr alkoholische Getränke (z.B. Gläser Wein, Flaschen Bier etc.) bei einer Gelegenheit zu sich genommen?**

Mehrmals in der Woche ☐

Einmal in der Woche ☐

Einmal im Monat ☐

Weniger als einmal im Monat ☐

Nie ☐

- E5. Haben Sie in den letzten 30 Tagen Alkohol getrunken, also Bier, Wein, Spirituosen, Apfelwein oder andere alkoholische Getränke?**

Ja ☐

Nein ☐

- E6. Wie oft haben Sie in den letzten 30 Tagen Alkohol getrunken?**

Täglich ☐

4- bis 5-mal in der Woche ☐

2- bis 3-mal in der Woche ☐

Einmal pro Woche ☐

2- bis 3-mal im Monat ☐

Einmal ☐

- E7. Wenn Sie nun an einen Tag denken, an dem Sie Alkohol trinken: Ungefähr wie viele Gläser oder Flaschen trinken Sie da normalerweise?**

Ein Getränk = 1 Glas Wein (15cl) oder 1 Dose/Flasche Bier oder Apfelwein (33cl) oder 4cl Spirituosen

Weniger als 1 Glas / Flasche ☐

1 - 2 Gläser / Flaschen ☐

3 - 4 Gläser / Flaschen ☐

5 - 6 Gläser / Flaschen ☐

7 - 9 Gläser / Flaschen ☐

10 oder mehr Gläser / Flaschen ☐

- E8. Wie oft haben Sie im letzten Monat mindestens 30 Minuten lang Sport getrieben (z. B. Laufen, Spaziergehen/Walking oder Radfahren)?**

Fast jeden Tag ☐

Ein paar Mal pro Woche ☐

Ein paar Mal im letzten Monat ☐

Überhaupt nicht ☐

E9. Warum treiben Sie Sport oder betätigen sich körperlich?

	Stimme voll und ganz zu	Stimme eher zu	Stimme eher nicht zu	Stimme überhaupt nicht zu
Um Gutes für die Gesundheit zu tun	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um dem Altern entgegen zu wirken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um Spaß zu haben	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um mich zu entspannen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um attraktiver auszusehen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um mit Freunden zusammen zu sein	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um durch Laufen oder Fahrradfahren Geld zu sparen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um meine körperliche Leistungsfähigkeit zu verbessern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um mein Gewicht zu kontrollieren	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um mein Selbstwertgefühl zu steigern	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Um sitzende Tätigkeiten auszugleichen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

E10. Wie zufrieden sind Sie mit Ihrem Schlaf?

Sehr zufrieden	<input type="checkbox"/>
Zufrieden	<input type="checkbox"/>
Weder zufrieden noch unzufrieden	<input type="checkbox"/>
Unzufrieden	<input type="checkbox"/>
Sehr unzufrieden	<input type="checkbox"/>

E11. Haben Sie ein Familienmitglied oder einen Freund/eine Freundin, der/die Sie zu Arztbesuchen begleitet?

Ja	<input type="checkbox"/>
Nein	<input type="checkbox"/>

E12. Nehmen Sie aktiv am Gemeindeleben teil, üben Sie zum Beispiel ein Ehrenamt aus oder nehmen Sie an Aktivitäten teil?

Fast jeden Tag	<input type="checkbox"/>
Ein paar Mal pro Woche	<input type="checkbox"/>
Ein paar Mal pro Monat	<input type="checkbox"/>
Ein paar Mal pro Jahr	<input type="checkbox"/>
Überhaupt nicht	<input type="checkbox"/>

E13. Wie oft essen Sie Obst? Nicht gemeint sind Obstsäfte aus Konzentrat.

Gemeint sind auch Säfte aus frischen Früchten. Nicht gemeint sind Säfte aus Konzentrat oder verarbeiteten Früchten oder Säfte mit Zuckerzusatz.

Täglich oder mehrmals täglich	<input type="checkbox"/>
4 bis 6 Mal pro Woche	<input type="checkbox"/>
1 bis 3 Mal pro Woche	<input type="checkbox"/>
Weniger als einmal pro Woche	<input type="checkbox"/>
Nie	<input type="checkbox"/>

E14. Wie viele Portionen Obst essen Sie pro Tag? Eine Portion entspricht einer Handvoll Obst.

--	--	--	--	--	--	--	--	--	--

E15. Wie oft essen Sie Gemüse oder Salat? Nicht gemeint sind Kartoffeln und Säfte aus Konzentrat.

Gemeint sind auch Suppen (warme und kalte) sowie Säfte aus frischem Gemüse. Nicht gemeint sind Säfte aus Konzentrat oder verarbeitetem Gemüse oder Säften mit Zuckerzusatz.

Täglich oder mehrmals täglich	<input type="checkbox"/>
4 bis 6 Mal pro Woche	<input type="checkbox"/>
1 bis 3 Mal pro Woche	<input type="checkbox"/>
Weniger als einmal pro Woche	<input type="checkbox"/>
Nie	<input type="checkbox"/>

E16. Wie viele Portionen Gemüse oder Salat essen Sie pro Tag? Eine Portion entspricht einer Handvoll Gemüse oder Salat.

--	--	--	--	--	--	--	--	--	--

E17. Wie häufig essen Sie Fleisch und/oder Wurstwaren?

Täglich	<input type="checkbox"/>
3-4 mal in der Woche	<input type="checkbox"/>
1-2 mal in der Woche	<input type="checkbox"/>
1-2 mal im Monat	<input type="checkbox"/>
Seltener als 1 mal im Monat	<input type="checkbox"/>
Nie	<input type="checkbox"/>

Teil F: Ernährungsinformation

Bei diesem Teil der Befragung geht es um gesundheitsrelevante Informationen auf Lebensmittelverpackungen. Diese Karte zeigt Ihnen Informationen, die Sie auf der Rückseite einer Eiscremepackung, die Sie gerade im Supermarkt gekauft haben, finden könnten. Lesen Sie die Informationen aufmerksam durch. Bitte beantworten Sie die Fragen, sobald Sie mit dem Durchlesen der Informationen fertig sind.

In diesem Teil werden nun einige Fragen zu den Nährwertangaben auf diesem Etikett gestellt. All diese Fragen können mit Hilfe der Karte, die Sie gerade gesehen haben, beantwortet werden.

F1. Wie viele Kalorien (kcal) nehmen Sie zu sich, wenn Sie den ganzen Inhalt der Packung essen?

--	--	--	--	--	--	--	--	--	--

- [illegible]

- [illegible]

- Ja ☐
- Nein ☐

- | |
|--|
| |
|--|

G1. Was ist der höchste Bildungsabschluss, den Sie erreicht haben (in der Regel haben Sie dafür ein Zeugnis oder ein Diplom erhalten)?

- | | |
|---|--------------------------|
| Keine Ausbildung | <input type="checkbox"/> |
| Volksschule | <input type="checkbox"/> |
| Hauptschule | <input type="checkbox"/> |
| Allgemeinbildende höhere Schule mit Matura oder Lehre | <input type="checkbox"/> |
| Höhere Lehrgänge/Berufsfachschule | <input type="checkbox"/> |
| (Fach-)Hochschule/Universität (Erst-Abschluss) | <input type="checkbox"/> |
| Doktoratsstudium | <input type="checkbox"/> |

G2. Haben Sie jemals eine medizinische Ausbildung durchlaufen oder in einem medizinischen Beruf gearbeitet (z.B. als Krankenpfleger/in, Arzt/Ärztin, Apotheker/in)?

Ja ☐
Nein ☐

G3. Wie ist Ihr aktueller “Haupt”-Beschäftigungsstatus?

Angestelltenverhältnis oder akademischer Beruf inkl. unbezahlte Arbeit für ein Familienunternehmen, Lehre oder bezahltes Praktikum ☐

Schüler/in, Student/in, in Weiterbildung, unbezahltes Praktikum ☐

Im Militär- oder Zivildienst ☐

Sonstiges ☐

Sonstiges

G4. In welchen Umfang sind Sie angestellt?

Vollzeit ☐
Teilzeit ☐

G5.

	Sehr einfach	Ziemlich einfach	Ziemlich schwierig	Sehr schwierig
Können Sie bei Bedarf Geld für Medikamente aufbringen, die Sie aus gesundheitlichen Gründen benötigen? Ist das für Sie ...?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Können Sie es sich leisten, zum Arzt zu gehen? Ist das für Sie ...? (Hinweis: Zeit, Krankenversicherung, Kosten, Transport)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

G6. Hatten Sie in den letzten 12 Monaten am Ende des Monats Schwierigkeiten beim Bezahlen Ihrer Rechnungen?

Meistens ☐
Gelegentlich ☐
Nahezu nie/ nie ☐

G7. Auf der folgenden Skala entspricht die Stufe 1 der niedrigsten, die Stufe 10 der höchsten Stellung in der Gesellschaft. Können Sie mir sagen, wo Sie sich selbst einordnen würden?

1 - Niedrigste Stellung innerhalb der Gesellschaft	<input type="checkbox"/>
	2 <input type="checkbox"/>
	3 <input type="checkbox"/>
	4 <input type="checkbox"/>
	5 <input type="checkbox"/>
	6 <input type="checkbox"/>
	7 <input type="checkbox"/>
	8 <input type="checkbox"/>
	9 <input type="checkbox"/>
10 - Höchste Stellung innerhalb der Gesellschaft	<input type="checkbox"/>

G8. Was ist Ihr Nettohaushaltseinkommen pro Monat?

Weniger als 800€	<input type="checkbox"/>
Mehr als 800€ aber weniger als 1350€	<input type="checkbox"/>
Mehr als 1,350€ aber weniger als 1,850€	<input type="checkbox"/>
Mehr als 1,850€ aber weniger als 2,400€	<input type="checkbox"/>
Mehr als 2,400€ aber weniger als 2,950€	<input type="checkbox"/>
Mehr als 2,950€ aber weniger als 3,600€	<input type="checkbox"/>
Mehr als 3,600€ aber weniger als 4,400€	<input type="checkbox"/>
Mehr als 4,400€ aber weniger als 5,250€	<input type="checkbox"/>
Mehr als 5,250€ aber weniger als 6,450€	<input type="checkbox"/>
Mehr als 6,450€	<input type="checkbox"/>

Teil H: Demographische Daten

H1. Welche Staatsangehörigkeit besitzen Sie?

Belgien	<input type="checkbox"/>
Bulgarien	<input type="checkbox"/>
Dänemark	<input type="checkbox"/>
Deutschland	<input type="checkbox"/>
Finnland	<input type="checkbox"/>
Frankreich	<input type="checkbox"/>
Griechenland	<input type="checkbox"/>
Großbritannien (inkl. Nordirland)	<input type="checkbox"/>
Estland	<input type="checkbox"/>
Irland	<input type="checkbox"/>
Italien	<input type="checkbox"/>
Lettland	<input type="checkbox"/>
Litauen	<input type="checkbox"/>
Luxemburg	<input type="checkbox"/>
Malta	<input type="checkbox"/>
Niederlande	<input type="checkbox"/>
Österreich	<input type="checkbox"/>
Polen	<input type="checkbox"/>
Portugal	<input type="checkbox"/>
Rumänien	<input type="checkbox"/>
Schweden	<input type="checkbox"/>
Slowakei	<input type="checkbox"/>
Slowenien	<input type="checkbox"/>
Spanien	<input type="checkbox"/>
Tschechische Republik	<input type="checkbox"/>
Ungarn	<input type="checkbox"/>
Zypern (Südzypern)	<input type="checkbox"/>
Sonstiges	<input type="checkbox"/>

Sonstiges

H2. Geschlecht

weiblich	<input type="checkbox"/>
männlich	<input type="checkbox"/>

H3. Wie alt sind Sie?

--	--	--	--	--	--	--	--	--	--

H4. Wie groß sind Sie? (Ungefähr)

--	--	--	--	--	--	--	--	--	--

H5. Wie viel wiegen Sie? (Ungefähr)

--	--	--	--	--	--	--	--	--	--

H6. Was von dieser Liste trifft auf Sie persönlich zu?

- Ihr Vater und Ihre Mutter wurden in Österreich geboren ☐
- Ein Elternteil wurde in Österreich geboren und der andere in einem anderen Mitgliedstaat der Europäischen Union ☐
- Ein Elternteil wurde in Österreich geboren und der andere außerhalb der Europäischen Union ☐
- Ihre Mutter und Ihr Vater wurden in einem anderen Mitgliedstaat der Europäischen Union geboren ☐
- Ein Elternteil wurde in einem anderen Mitgliedstaat der Europäischen Union geboren und der andere außerhalb der Europäischen Union ☐
- Ihre Mutter und Ihr Vater wurden außerhalb der Europäischen Union geboren ☐

H7. Was ist Ihr Familienstand?

- Ledig ☐
- Verheiratet ☐
- Getrennt/Geschieden ☐
- Verwitwet ☐

H8. Wie ist Ihre aktuelle Wohnsituation?

- Allein lebend/Single-Haushalt ☐
- Zusammen lebend/gemeinsamer Haushalt ☐
- In einer festen Beziehung, aber nicht zusammen lebend ☐

H9. Haben Sie Kinder?

- Ja, unter 15 Jahre ☐
- Ja, 15 Jahre oder älter ☐
- Ich habe keine Kinder ☐

Vielen Dank, dass Sie an unserer Studie teilgenommen haben!

Bei Rückfragen stehen wir Ihnen jederzeit gerne unter health.literacy@gmx.net zur Verfügung.

Rico Sattler & Tanja Muschnig

A2 Interview guideline

Questionnaire

How did you experience the questionnaire?

Which parts were easy/hard?

Ask for examples of relevance in everyday life

Health literacy

What is your understanding of HL?

If not sure, have you heard about HL before this study?

How does HL affect people's life?

What is your experience with HL (docs talking to patients)?

In your opinion, what is your opinion about the HL level of the Austrian population?

What is your understanding of health and well-being (satisfaction with life?)

How could higher/lower health literacy have an impact on how you navigate through the healthcare system?

Lifestyle & Health

Would you describe your lifestyle as healthy or unhealthy? Please explain.

Which behaviors of your professional/personal life would you consider as healthy/unhealthy?

Which factors would you say influence your quality of life?

Action

Have you ever taken the initiative to improve or change your lifestyle?

Do you make lifestyle decisions consciously?

How do you try to adjust your lifestyle according to your doctor's recommendations?

What would you like to change about your health status? And is there anything you could do to change it?

Would you know where to get more reliable information about the desired changes?

Sports

Can you describe your physical activities?

How would you evaluate the sport options offered by your employer?

What hinders you from doing sports?

What is your experience of the effect that physical activity has on mental wellbeing?

Nutrition

How does your regular diet look like?

How could you improve your eating habits and what keeps you from doing so?

How does the food offered at your workplace influence your consumption?

What is your opinion on the nutritional information on food packages?

How understandable are they?

Would you wish for a different presentation?

Did you ever change your food choice because of nutritional values?

What is your experience with allergies, concerning yourself and the people around you?

Smoking

Do you smoke or have you ever been smoking?

Do you see any possible impact on your health?

What are the reasons you and the people around you smoke/quit smoking?

Alcohol

Could you tell us about your (alcohol) drinking habits?

What influences your alcohol intake?

How has the information you received about the impact of drinking alcohol on health influenced your drinking habits?

Environment

Which factors of your environment influences your health (noise, pollution, green spaces)?

Tell us about your experience with that

How does the area where you live impact your lifestyle (eg. options to do sports, etc)

Vaccination

How do you decide on which vaccination to get and which not?

Is there anything that would help you to make this decision?

How important are preventive measures and vaccinations for you?

What are your main sources for information about preventive measures such as vaccines?

Are reliable sources sufficiently available?

Media

How do you evaluate the reliability of information provided on media?

What experiences do you have with misleading lifestyle information provided on media?

What makes media information reliable for you?

If you download a health app, would you trust medical information in that app?

Which health innovations/trends do you follow and what is your experience with it?

Workplace

Is health literacy a topic at your workplace?

How would you describe the relation between your own health and your work environment?

What are programs/initiatives to support health at your workplace that would you wish for?

How does working in the healthcare sector influence your relation to your own health situation?

How is health literacy influencing your professional life? Does it have an impact on how you do your job?

Which issues do you see between the communication between doctors/nurses and patients?

Healthcare system

Please tell me about good and bad experiences you have had with the healthcare system.

Why do you think it played out that way?

Promotion

Have you heard about health literacy programs in Austria?

Do you know of any campaigns/information sources that changed your habits?

End

Overall, would you say that health literacy influences lifestyle?

A3 Ethics approval

mci ethics assessment application form - part 1.

Study Title: Health literacy in the hospital workforce

Name of Lead Researcher: Rico Sattler & Tanja Muschnig
(student in case of Bachelor/Master thesis)

Department: International Health and Social Management

E-mail: health.literacy@gmx.net

Name and E-mail of MCI Supervisor: Dr. Armin Fidler, MD, MPH, MSc Armin.Fidler@mci.edu
(in case of Bachelor/Master thesis)

Please tick the following boxes, if the answer is "yes".	
Has this research application or any application of a similar nature connected to this research project/thesis been refused ethical approval/clearance by another review committee?	<input type="checkbox"/>
Will your research project/thesis deliberately involve misleading participants in any way?	<input type="checkbox"/>
Is there a risk of participants experiencing either physical or psychological distress or discomfort? <i>If yes, give details on the following page and state what you will tell them to do if they should experience any such problems (e.g. who they can contact for help).</i>	<input type="checkbox"/>
Will your research project/thesis involve access to health records of personal or confidential information, including genetic or other biological information?	<input type="checkbox"/>
Does your study involve any of the following?	<input type="checkbox"/>
<ul style="list-style-type: none"> Children (under 18 years of age) People with intellectual or communication difficulties Vulnerable groups (e.g. children and adults with a physical or psychological disability; ethnic minorities; individuals with a learning disability or cognitive impairment; individuals in a dependent or unequal relationship; pregnant women) Patients 	<input type="checkbox"/>
Has this research application or any application of a similar nature connected to this research project/thesis already received external ethical clearance? <i>If yes, a copy of said clearance has to be attached to this submission.</i>	<input type="checkbox"/>

mci ethics assessment application form - part 2.

1) Purpose of study including academic rationale (motivation, aim, objectives, etc.)

"Health literacy is linked to literacy and entails people's knowledge, motivation and competences to access, understand, appraise and apply health information in order to make judgements and take decisions in everyday life concerning health care, disease prevention and health promotion to maintain or improve quality of life during the life course" (Kickbusch, 2013). Although health literacy is of growing importance, knowledge about health literacy among hospital workers, especially of different socioeconomic subgroups, is still limited, and the impact of health literacy on lifestyle choices warrants further investigation. The objective of this project is to investigate health literacy levels among hospital workers in Austria. The study aims to get a better understanding of the influence of socioeconomic factors by comparing health literacy levels among different employee subgroups and find correlations between health literacy levels and lifestyle choices.

2) Brief description of methods and measurements to be used:

(details of the research method to be used; how will the data be collected; what tools will be used; where will the data be collected, etc.)

To obtain a comprehensive picture of the situation, data collection will be based on a sequential mixed method, which is composed of a quantitative part and a qualitative part. Quantitative data collection will be conducted via HUS-EU-Q86 questionnaire (Sørensen et al., 2015), while the qualitative data collection is going to consist of semi structured interviews (Flick, 2015). The questionnaire aims to obtain quantitative data about the level of health literacy within the healthcare workforce. Depending on hospital preference, it can be filled out using an online survey platform or handed out in paper form at site. The interviews will be conducted in a random sample of participants and should provide a comprehensive understanding of the subject's health literacy as well as its influence on the behavior of participants from the perspective of participants themselves. They will be recorded as audio versions and transcribed. Where possible interviews will be conducted in person, otherwise online.

3) Participants – recruitment methods, number, age, gender, exclusion/inclusion criteria, including statistical justification for numbers of participants:

(who should participate in the study; how will the sample be collected; how will participants be asked to take part; etc.)

The research aims to include around 5 hospitals, with a size of roughly 200 - 500 beds. All hospitals in Austria falling into this size category will be contacted and asked for willingness to participate. Hospitals that agree to participate and have a central email server will be asked to send out links to the online questionnaire to all hospital employees. If this approach is not feasible, in-person collection of data at site will aim at gathering random participants. Overall, the study aims to include at least 30 hospital employees in the questionnaire for the quantitative data collection (10 per employment group). Depending on the number of participating hospitals up to 20% of those participants are expected to participate in the in-depth interviews (up to 6 per hospital, 2 per employment category). Participants will be split into the following employment categories:

- 1) Medical professionals (doctors, nurses, hospice workers, emergency medical technicians, and other licensed caregivers)
- 2) Administrative employees (management, office staff, human resource, finance, and legal clerks, and other back office clerks)
- 3) Support staff (patient services assistants, cleaning staff, and porters)

4) Debriefing arrangements:

(how will informed consent be achieved; will participants be free NOT to take part if they choose; etc.)

Participants will be invited to take part in the survey per email or in person. They will receive study information and an informed consent form (either web- or paper-based). Participation will be fully voluntary and can be declined at any point. Participation in the interview will also be voluntary and contact information of participants that are interested in an interview will be collected separately at the end of the survey.

5) A clear concise statement of the ethical considerations raised by the study and how you intend to deal with them:

(will any individual be identifiable in the findings; how will the findings be disseminated; is there any possibility of any harm to participants who take part or do not take part; how/where will data be stored; who will have access to data; how long will data be kept; etc.)

Survey data will be collected anonymously and interview data will be anonymized so that no names will be published, neither hospital nor participant names will be disseminated. If possible, a publication of the study in a peer reviewed journal is planned. Participants agree to dedicate their time to participation. Survey data will not be identifiable and interview recordings will be deleted as soon as they are transcribed. Participants have the right to cancel their participation and request a deletion of their data at any point.

mci ethics assessment application form - confirmation.

I confirm that I will (where relevant)

- Provide participants with an information sheet (or web-page for web-based surveys/experiments) that describes the main procedures (see example "information sheet")
- Tell participants that their participation is voluntary
- Obtain informed consent for participation (see example "consent form")
- Should the research be observational, ask participants for their consent to be observed
- Tell participants that they may withdraw at any time and for any reason without penalty
- Give participants the option of omitting questions they do not wish to answer if a questionnaire is used
- Tell participants that their data will be treated with full confidentiality and that, if published, it will not be identified as theirs
- Tell participants that all recordings, e.g. audio/video photographs, will not be identifiable unless prior written permission has been given
- On request, debrief participants at the end of their participation (i.e. give them a brief explanation of the study)

Signed

Tanja Hueb, Rico J. Hueb

Date

19.03.2019, 20.06.2019

Lead Researcher / Student in case of Bachelor/Master thesis

Signed

L. K. K.

Date

29.05.2019

MCI supervisor in case of Bachelor/Master thesis

A3.1 Informed consent forms

A3.1.1 Survey informed consent

Einverständniserklärung zur Teilnahme an der Studie

Gemäß den neuen Datenschutzrichtlinien der EU ist vorgesehen, dass sich die Teilnehmer/innen an empirischen Studien explizit und nachvollziehbar einverstanden erklären, dass sie freiwillig an der Forschung teilnehmen. Aus diesem Grund möchten wir Sie bitten, der vorliegenden Einverständniserklärung zuzustimmen, bevor Sie an unserer Studie teilnehmen. Zu Ihrer Information sind nachfolgend einige Hinweise zu unserem Forschungsvorhaben aufgeführt.

Allgemeines

Die Studie wird im Fachbereich International Health & Social Management am Management Center Innsbruck (MCI) durchgeführt und verfolgt rein wissenschaftliche Zwecke. Der Fragebogen ist anonym und kann nicht zu Ihnen zurückverfolgt werden. Sollten Sie sich dazu einverstanden erklären nachfolgend an einem Interview teilzunehmen, wird dieses akustisch aufgezeichnet und anonymisiert.

Sie erteilen mit der Teilnahme Ihr Einverständnis, dass die erhobenen Daten zur Weiterverarbeitung gespeichert und anonymisiert an professionelle Transkriptionsdienste weitergegeben werden dürfen. Weiters stimmen Sie der Mitteilung der Studienergebnisse, die nicht auf einzelne Teilnehmer zurückführbar sind, an die teilnehmenden Krankenhäuser zu. Sie können Ihre Einverständniserklärung für Daten die durch Interviews erhoben wurden jederzeit, auch per e-mail widerrufen.

Freiwilligkeit

Ihre Teilnahme an dieser Umfrage ist freiwillig. Es steht Ihnen zu jedem Zeitpunkt dieser Studie frei, Ihre Teilnahme abubrechen, ohne dass Ihnen dadurch Nachteile entstehen.

Offene Fragen

Falls Sie noch Fragen zu dieser Studie haben sollten, wenden Sie sich bitte an:
health.literacy@gmx.net

Einverständniserklärung

Hiermit erkläre ich mich damit einverstanden, dass die von mir angegebenen LimeSurvey Daten zu akademischen Forschungszwecken gespeichert und verarbeitet werden.

A3.1.2 Interview informed consent

Einverständniserklärung zur Teilnahme am Interview

Gemäß den neuen Datenschutzrichtlinien der EU ist vorgesehen, dass sich die Teilnehmer/innen an empirischen Studien explizit und nachvollziehbar einverstanden erklären, dass sie freiwillig an der Forschung teilnehmen. Aus diesem Grund möchten wir Sie bitten, der vorliegenden Einverständniserklärung zuzustimmen, bevor Sie am Interview Teil unserer Studie zum Thema "Gesundheitskompetenz unter Krankenhausangestellten" teilnehmen. Zu Ihrer Information sind nachfolgend einige Hinweise zu unserem Forschungsvorhaben aufgeführt.

Allgemeines

Die Studie wird im Fachbereich International Health & Social Management am Management Center Innsbruck (MCI) durchgeführt und verfolgt rein wissenschaftliche Zwecke. Das Interview wird akustisch aufgezeichnet und anonymisiert ausgewertet. Die Ergebnisse können nicht zu Ihnen zurückverfolgt werden.

Sie erteilen mit der Teilnahme Ihr Einverständnis, dass Ihre Aussagen zur Weiterverarbeitung gespeichert und anonymisiert an Transkriptionsdienste weitergegeben werden dürfen. Weiters stimmen Sie der Mitteilung der Studienergebnisse, die nicht auf einzelne Teilnehmer zurückführbar sind, an die teilnehmenden Krankenhäuser zu. Sie können Ihre Einverständniserklärung für Daten, die durch Interviews erhoben wurden jederzeit, auch per e-mail widerrufen.

Freiwilligkeit

Ihre Teilnahme an diesem Interview ist freiwillig. Es steht Ihnen zu jedem Zeitpunkt dieser Studie frei, Ihre Teilnahme abubrechen, ohne dass Ihnen dadurch Nachteile entstehen.

Offene Fragen

Falls Sie noch Fragen zu dieser Studie haben sollten, wenden Sie sich bitte an:
health.literacy@gmx.net

Einverständniserklärung

Hiermit erkläre ich mich damit einverstanden, dass die von mir angegebenen Interview Aussagen zu akademischen Forschungszwecken akustisch aufgezeichnet und verarbeitet werden.

Datum

Name

Unterschrift

A4 Results

Table A4.1 Health status in different employment categories

	MED	ADM	SUP	TOTAL
How is your health in general?				
Very good	3 (23.1%)	4 (36.4%)	2 (25.0%)	9 (28.1%)
Good	8 (61.5%)	6 (54.5%)	3 (37.5%)	17 (53.1%)
Fair	2 (15.4%)	1 (9.1%)	3 (37.5%)	6 (18.8%)
How satisfied are you with your health? ¹				
Very satisfied	5 (31.3%)	7 (53.8%)	4 (28.6%)	16 (37.2%)
Satisfied	8 (50.0%)	4 (30.8%)	5 (35.7%)	17 (39.5%)
Neither satisfied nor dissatisfied	2 (12.5%)	2 (15.4%)	3 (21.4%)	7 (16.3%)
Dissatisfied	1 (6.3%)	0 (0.0%)	2 (14.3%)	3 (7.0%)
How is your life quality? ^{*1}				
Very good	5 (31.3%)	9 (69.2%)	4 (28.6%)	18 (41.9%)
Good	9 (56.3%)	3 (23.1%)	4 (28.6%)	16 (37.2%)
Fair	2 (12.5%)	1 (7.7%)	6 (42.9%)	9 (20.9%)
Do you have any long-term illness or health problem? (Problems which have lasted, or you expect to last, for 6 months or more?)				
Yes, more than one	1 (6.3%)	0 (0.0%)	0 (0.0%)	1 (2.7%)
Yes, one	9 (56.3%)	2 (20.0%)	5 (45.5%)	16 (43.2%)
No	6 (37.5%)	8 (80.0%)	6 (54.5%)	20 (54.1%)
For at least the last 6 months, how much have your health problems limited the activities you would usually do?				
Severely limited	1 (6.7%)	0 (0.0%)	0 (0.0%)	1 (2.5%)
Limited but not severely	8 (53.3%)	5 (41.7%)	6 (46.2%)	19 (47.5%)
Not limited at all	6 (40.0%)	7 (58.3%)	7 (53.8%)	20 (50.0%)

*Significant difference between employment groups at the 0.05 level (2-tailed).

¹Author's own translation

Abbreviations: MED = Medical professionals, ADM = Administrative employees, SUP= Support staff

Table A4.2 Frequency of health care service use

How many times have you...	MED	ADM	SUP	TOTAL
... had to contact the emergency service in the last 2 years?				
0	12 (75.0%)	12 (92.3%)	10 (76.9%)	34 (81.0%)
1 - 2 times	4 (25.0%)	1 (7.7%)	3 (23.1%)	8 (19.0%)
... been to the doctor in the last 12 months?				
0	2 (12.5%)	1 (7.7%)	2 (15.4%)	5 (11.9%)
1 - 2 times	11 (68.8%)	9 (69.2%)	8 (61.5%)	28 (66.7%)
3 - 5 times	1 (6.3%)	2 (15.4%)	1 (7.7%)	4 (9.5%)
6 times or more	2 (12.5%)	1 (7.7%)	2 (15.4%)	5 (11.9%)
... used a hospital service in the last 12 months?				
0	14 (87.5%)	11 (84.6%)	8 (66.7%)	33 (80.5%)
1 - 2 times	2 (12.5%)	2 (15.4%)	4 (33.3%)	8 (19.5%)
... used services from other health professionals, such as dentist, physiotherapist, psychologist, dietician, or optician in the last 12 months?				
0	5 (31.3%)	1 (7.7%)	2 (15.4%)	8 (19.0%)
1 - 2 times	7 (43.8%)	8 (61.5%)	7 (53.8%)	22 (52.4%)
3 - 5 times	2 (12.5%)	3 (23.1%)	3 (23.1%)	8 (19.0%)
6 times or more	2 (12.5%)	1 (7.7%)	1 (7.7%)	4 (9.5%)

Abbreviations: MED = Medical professionals, ADM = Administrative employees, SUP= Support staff